Doctrine and Doxography

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Edited
on behalf of the Herculaneum Society

by

Alessandro Barchiesi, Robert Fowler,
Dirk Obbink and Nigel Wilson

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Preface

The essays collected here, all here revised, were first presented in at a bicontinental conference hosted in July, 2005, by Apostolos Pierris, to whom we all express our great thanks, not only for the invitation, but also for the magnificent settings: First on Samos, Pythagoras' native land, and then by chartered boat over to Kuşadası, as close to Heraclitus' home town of Ephesus as modern facilities allow. We regret that the original contributions by Serge Mouraviev, Arnold Hermann and Dirk Obbink are not present here, and that it has taken so long to bring these essays to print.

David Sider
Dirk Obbink

Abbreviations

The fragments of Pythagoras, Heraclitus, and the other Presocratics are given as in DK (14 is DK's number for the former, 59 for the latter). Frequently cited modern works are abbreviated as indicated below.

Bernabé	A. Bernabé, *Poetae Epici Graeci. Testimonia et Fragmenta.* 2 vols. Berlin 1996–2004. T & F numbers for Orpheus and Orphica as in pars 2, fasc. 1–3.
Dilcher, *H.*	R. Dilcher, 1995, *Studies in Heraclitus.* Hildesheim 1995.
Diels, *DG*	Hermann Diels, *Doxographi Graeci.* Berlin 1879.
DK	H. Diels and W. Kranz, *Die Fragmente der Vorsokratiker*^{6}. Zurich 1952 [later "editions" are merely photographic reprints; earlier editions were edited by Diels alone]
FGrHist	*Fragmente der griechische Historiker*, ed. F. Jacoby. Leiden.
FHSG	William Fortenbaugh, Pamela Huber, Robert Sharples, and Dimitri Gutas, *Theophrastus of Eresus: Sources for his Life, Writings, Thought and Influence.* 2 vols. Leiden 1992.
Guthrie, *HGP*	W. K. C. Guthrie, *A History of Greek Philosophy.* Vol. 1 Cambridge 1962.
Kahn, *H.*	C. Kahn, *The Art and Thought of Heraclitus.* Cambridge 1979.
K-G	R. Kühner and B. Gerth, *Ausfürliche Grammatik der griechischen Sprache.* Hannover and Leipzig, 1904.
Kirk, *H.*	G. S. Kirk, *Heraclitus: The Cosmic Fragments.* Cambridge, 1954.
KRS	Kirk, G. S., J. E. Raven, and M. Schofield. *The Presocratic Philosophers*. 2nd edn. Cambridge 1983.
Marcovich, *H.*	M. Marcovich, *Heraclitus: Greek Text with a Short Commentary* Merida 1967. 2nd ed., Sankt Augustin: Academia Verlag, 2001.
Mouraviev, *H.*	S. Mouraviev, *Heraclitea: Édition critique complète des témoignages sur la vie et l'oeuvre d'Héraclite d'Éphèse et des vestiges de son livre*, cited further by volume. Sankt Augustin 1999–.

Contents

I. Pythagoras

1. Catherine Rowett
Philosophy's Numerical Turn: Why the Pythagoreans' Interest in Numbers is Truly Awesome 3

2. Leonid Zhmud
Pythagorean Communities: From Individuals to a Collective Portrait 33

3. Richard McKirahan
Aristotle on the Pythagoreans: His Sources and his Accounts of Pythagorean Principles 53

4. Carl Huffman
Philolaus' Critique of Heraclitus 121

II. Heraclitus

5. Aryeh Finkelberg
Heraclitus, the Rival of Pythagoras 147

6. Herbert Granger
Early Natural Theology: The Purification of the Divine Nature 163

7. Anthony A. Long
Heraclitus on Measure and the Explicit Emergence of Rationality 201

8. Gábor Betegh
On the physical aspect of Heraclitus' psychology: With New Appendices 225

9. Roman Dilcher
How Not to Conceive Heraclitean Harmony 263

10. Enrique Hülsz
Heracliitus on *Logos*: Language, Rationality and the Real 281

11. Daniel W. Graham
Once More unto the Stream 303

12. David Sider
Heraclitus' Ethics 321

Contributors 335

General Index 339

Index Locorum Potiorum 345

1. Philosophy's Numerical Turn

Why the Pythagoreans' Interest in Numbers is Truly Awesome

Catherine Rowett

We do not know a great deal about Pythagoreanism in the early days when Pythagoras was around. However, from what we do know, it seems reasonable, and not hugely controversial, to suggest that a passion for numbers was at least an embryonic part of the early heritage, something that already belongs in the genuine Pythagorean core, and was certainly already central by what I shall call the "second generation" (including Philolaus). [1] It is not just a feature of the crust of lichen and fungus that grew round the name of Pythagoras in later generations (that is, the period we regularly call "Neopythagoreanism").

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[1] As regards Pythagoras himself, this is somewhat controversial. Burkert denies that the stuff about numbers (mainly in Aristotle) has anything to do with the real Pythagoras. He claims that Aristotle is careful to speak of the "so-called" Pythagoreans, and that he means the second generation, the fifth century Pythagoreans, not Pythagoras himself. By contrast, Burkert claims, the authentic material about Pythagoras himself is almost exclusively about mysticism and wonder-working. See *Lore and Science in Ancient Pythagoreanism*, trans. E. L. Minar Jr. Cambridge, Mass. 1972. My claim is not that all the elaborate number theories can be traced to the earliest Pythagoreanism of Pythagoras's time, but that an embryonic interest in harmony, and in the mystical aspects of number, such as the oath by the tetraktys, can safely be traced back to that period, and that a more developed interest in number is evident in the second generation. Burkert's polemic was against F. M. Cornford, "Mysticism and science in the Pythagorean tradition,"' in A. P. D. Mourelatos (ed.), *The Presocratics* (Garden City 1974) 135–60 originally published in 1922–3 (Cornford claimed that early Pythagoreans had a "mystical system" that came under criticism from Parmenides, and that later ones had a pluralist system that he called "number atomism" which was the object of Zeno's attack). C. J. de Vogel, *Pythagoras and Early Pythagoreanism: an Interpretation of Neglected Evidence on the Philosopher Pythagoras* (Assen 1966), published around the same time as Burkert's original publication date, and not directly addressed to his finished publication, takes a less austere line than Burkert about science in the first generation period.

But what kind of a passion for numbers do we find in the Pythagoreans? Is it the kind of enthusiasm that philosophers can safely hail as part of their authentic heritage? Can we attribute it to the real Pythagoras (and his early followers) with pride? Or is it an embarrassment, to be hushed up and omitted from the histories of real philosophy? Were some of the Pythagoreans guilty of an unfortunate misjudgement—perhaps even some of the greatest thinkers, perhaps Pythagoras himself, perhaps his followers, even the great Philolaus and Archytas, with the later Neopythagoreans continuing their strange speculations right into late antiquity? Did all or some of them fail to see the difference between respectable mathematics and mystical mumbo-jumbo? Did they get carried away with an inappropriate desire to put numbers where numbers should not be?

Jonathan Barnes gives a dramatic rendering of the dilemma for the historian of philosophy by inviting us first to approve and then to condemn. First he invites us to approve by sketching a story in which Pythagoras figures as a great mathematical hero and astronomer:

> These pious offerings portray an impressive figure: Pythagoras, discoverer and eponym of a celebrated theorem, was a brilliant mathematician; by applying his mathematical knowledge, he made progress in astronomy and harmonics, those sister sirens who together compose the music of the spheres; and finally, seeing mathematics and number at the bottom of the master sciences, he concocted an elaborate physical and metaphysical system and propounded a formal, arithmological cosmogony. Pythagoras was a Greek Newton; and if his intellectual bonnet hummed at times with an embarrassing swarm of mystico-religious bees, we might reflect that Sir Isaac Newton devoted the best years of his life to the interpretation of the number symbolism of the book of *Revelations*.
>
> If Greek science began in Miletus, it grew up in Italy under the tutelage of Pythagoras; and it was brought to maturity by Pythagoras' school, whose members, bound in fellowship by custom and ritual, secured the posthumous influence of their master's voice.[2]

But then he withdraws that story, because (he thinks) it is not true:

> What are we to make of this pleasing picture of a Newtonian Pythagoras? It is, alas, mere fantasy: the shears of scholarship soon strip Pythagoras of his philosophical fleece.[3]

---

[2] J. Barnes, *The Presocratic Philosophers* (London 1982) 100–101.

[3] Ibid. 101.

And thirdly he invites us instead to condemn the whole Pythagorean passion for numbers—by implication including the work of Pythagoras himself which is denigrated by association with late works from the Neopythagorean period such as the *Theologoumena arithmeticae* :

> What philosophical use did the Pythagoreans make of mathematics? The cynical will speak dismissively of number mysticism, arithmology, and other puerilities. And it is undeniable that a great quantity of Pythagorean 'number philosophy' is a 'number symbolism' of the most jejune and inane kind. … 'Touching on' arithmetic, the Pythagoreans were impressed by certain properties of the number 10; alas, their impression degenerated into a sort of mysticism: amazement, the nurse of philosophy, soon has her milk soured and turns into silly reverence and superstition. Those with a taste for intellectual folly will have their appetite sated if they go through the *Theologoumena Arithmeticae*. That Pythagorean work is a late compilation; the earliest examples of such symbolism are found in the *acousmata* and probably date from the time of Pythagoras himself: from first to last the Pythagoreans engaged in arithmology.[4]

Barnes offers us two options: we could admire Pythagoras if he was, as suggested, a Newtonian, whose mathematical discoveries were put to fine use in developing a mathematical astronomy and answers to physics that sought confirmation in mathematics. Or we could condemn him (and his followers) if the philosophical use to which they put their number work was mere mysticism and number symbolism. Since the first option seems to be ruled out by the lack of sound historical evidence for the fanciful portrait of the Newtonian Pythagoras, we are left with the second. And so we condemn.

My task in this paper is to persuade the reader that, notwithstanding Barnes's fine rhetoric on the matter, we should nevertheless admire, and not condemn, the Pythagorean enthusiasm for numbers, tracing its origins to Pythagoras himself and his immediate followers.[5]

---

[4] Ibid. 381.

[5] The mathematical interests are only one of the many kinds of wisdom attributed to Pythagoras. C. Huffman, "The Pythagorean tradition," in A. A. Long (ed.), *The Cambridge Companion to Early Greek Philosophy* (Cambridge 1999), 66–87, 66–7, gives a judicious account of a general difficulty created by the exaggerated reputation of Pythagoras, and the problematic source materials.

Pythagoras and the early Presocratic tradition.

One not particularly original route to defending the Pythagoreans would be to reject Barnes's claim that the Newtonian Pythagoras is mere fantasy. One could try to show that Pythagoras should be reliably credited with certain significant mathematical discoveries, that his work on harmonics was of a serious experimental nature, and that it is not improbable that he applied these studies to astronomy in a spirit of scientific inquiry, so as to show that his work on numbers was not mere speculation or mysticism. That is not the task I have set myself here. For not only is it not a particularly new project, but in any case it is not the case I want to make, for reasons that I shall go on to explain.

A second rather more interesting project does strike me as worthwhile however. In this first part of my paper I shall not so much seek to restore Pythagoras's credibility as a practitioner of the exact sciences as to ask why Pythagoras has been downgraded in the contemporary assessments, dismissed as a mystic and wonder-worker, and his followers dismissed as number mystics, while other Presocratics with rather similar points to make have been exalted as pioneers of embryonic scientific and philosophical thought. Is there really so much difference?

I shall consider two comparisons here: first between Anaximander's notion of the *apeiron* and Pythagorean discussions of the limited and unlimited, and secondly between Heraclitus' notion of *logos* and harmony, and the Pythagoreans' theories relating to proportion and harmony. Other examples could also be used, but these will be sufficient for this task.[6]

Let us start with the infinite. First, we should note the appearance of '*apeiron*' as a technical term in Anaximander's cosmology:

> Anaximander, son of Praxiades, of Miletus… said that the origin and element of things is τὸ ἄπειρον, being the first to use this term of the origin. Hippolytus *Refutatio* 1.6

This term is also prominent in certain Pythagorean documents, especially in Philolaus (chief among the second generation of Pythagoreans). When this term '*apeiron*' occurs in Pythagorean documents (and in Aristotle's reports about them), it invokes a contrast between limit and unlimited, and leads to a classification of numbers that spills out into reality more widely.[7] For the second generation Pythagoreans, the unlimited is evidently part of what makes number the basis of the whole of reality. This then gets taken up into some of the more peculiar bits of Platonic theory, in particular the so-called "unwritten doctrines" and the idea of the one and the indefinite dyad.[8]

---

[6] For instance astronomy, in which Philolaus was arguably far more advanced than his contemporaries such as Democritus, who appears to have rejected or ignored the advances made by the Pythagoreans. See D. R. Dicks, *Early Greek Astronomy to Aristotle* (London 1970) 80–81. Thanks to Carl Huffman for suggesting this additional example.

In our modern accounts of Pythagoreanism, we take the Pythagoreans to be talking about funny stuff, some kind of weird mathematical nonsense, when they mention the unlimited or indefinite, and we dismiss it as so much garbage, despite the fact that some respected interpretations take Philolaus's *apeira* to be kinds of material stuff or qualities rather similar to those that appear in other cosmologies of the time.[9] Yet when we meet the *apeiron* in Anaximander we are not so quick to diagnose something weird or mathematical. We treat it very differently. In Anaximander's case we do not see a primarily mathematical notion being used to create a metaphysical basis for reality, but we read Anaximander as speaking of an unlimited material: physical stuff. We read him as a materialist, and for that reason (it seems) the *apeiron* is defused. It doesn't smack of funny stuff, as it does in the hands of the Pythagoreans. It looks instead like a primitive kind of prime matter, something that Aristotle could look back to, and in which he could trace the origins of the material cause:

> For all things are either an origin or derivative from an origin, but of the *apeiron* there is no origin…, but it seems to be the origin of the rest and to encompass all things and control all things, as all those say who do not make any other causes apart from the *apeiron* such as mind or friendship.

---

[7] The terminology is widespread, particularly in material from Philolaus. See Philolaus B 1, 2, 3, 6 etc, and Aristot. *Meta.* A ch. 5.

[8] Aristot. *Meta.* 987b18–988a1. Details discussed in J. N. Findlay, *Plato; The Written and Unwritten Doctrines* (London 1974) ch. 2.

[9] Nothing in the extant fragments succeeds in making clear exactly what Philolaus has in mind when he refers to limiters and unlimiteds. Jonathan Barnes (above, n. 2), is among the readers who take the unlimiteds to be material stuffs. Carl Huffman, *Philolaus of Croton,* Cambridge 1993, discusses these interpretations, and mines the fragments for hints (pp. 37–53), and suggests (on the basis of a fragment from Aristotle's lost work on the Pythagoreans) that Philolaus's unlimiteds included time, void, fire and breath; but Aristotle's wording hardly makes that reading secure.

> And this is what is divine, for it is deathless and indestructible, as Anaximander says, and most of the natural philosophers.
>
> Aristotle *Physics* 203b6–7, 10–15.

But what really is the difference between the notion of *apeiron* in Anaximander and the notion of *apeiron* in the second generation of Pythagorean thought? Why do we take the one as a great advance in science, and the other as a kind of metaphysical mistake?

Secondly, we should notice that Anaximander has a universe structured with concentric circles, which is invoked to explain the positions and apparent movements of the heavenly bodies relative to the earth. We do not hear the music of the spheres in Anaximander's universe, but it is surely improbable that they do not utter sounds, for the circles that carry the stars have "flute-like" pipes with breathing holes through which the fire bursts forth when they are not blocked up.[10] It seems certain that the pressurised fiery vapour escaping from these ἐκπνοιαί must make sounds or notes that reflect the size and diameter of the pipe, rather like the sound of huge pan pipes played across the dark and misty heavens. How are their notes related? Harmonically or out of tune? Who can say? But we do know—roughly speaking—that Anaximander posited some numbers which claim to be the sizes (i. e. diameter) or distances (i. e. radius) of the circles of the sun and the moon and the stars.[11] The numbers seem to form a pattern, a sequence of a geometrical kind, probably 9, 18, 27, with the earth too having the numerical proportion 3:1 between its height and its diameter.[12] In fact, it seems that Anaximander was applying a sort of geometrical thinking to his speculations about the shape and the movements of the heavens.[13] Given that all must be aware that larger and longer flutes make deeper notes, it would be surprising if these numerical ratios did not also yield a sense that lower pitch sounds would issue from the vents of the larger wheels at the outer spheres of the cosmos.

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[10] Hippol. *Ref* 1.6.

[11] Hippol. *Ref* 1.6.

[12] The evidence for these numbers in the doxography, and the reconstruction of the mutilated texts, are discussed by D. O'Brien, "Anaximander's measurements," *CQ* 17 (1967) 423–32, and G. Naddaf, "Anaximander's measurements revisited," in Anthony Preus (ed.), *Before Plato* (Albany 2001) 5–23. See also C. Kahn, *Anaximander and the origins of Greek Cosmology* (New York 1960) 61–3, KRS 133–137, D. L. Couprie, "The Discovery of space: Anaximander's astronomy," in id., Robert Hahn, and Gerard Naddaf (eds.), *Anaximander in Context* (Albany, 2003) 165–254.

[13] This is widely agreed. Kahn suggests that the inspiration for Anaximander's numbers was mathematical rather than mystical; cf. Kahn (above, n. 12) 96–97). A possible link with the geometrical calculations used in architecture has been explored in detail by R. Hahn, *Anaximander and the Architects* (Albany 2001); and id., "Proportions and numbers in Anaximander and early Greek

When Pythagoras, or some Pythagoreans, posit harmonic proportions, based on ratios of numbers, as the explanatory principles in determining the structures of the heavens, and do this on the basis of discovering that physical sounds can indeed be analysed mathematically, as systematically related to the size and shape of the physical object that produces them, we generally dismiss their suggestions as idle speculation.[14] When Anaximander engages in some similar, though less well

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thought," in D. L. Couprie, Robert Hahn, and Gerard Naddaf, *Anaximander in Context* (Albany 2003) 73–163. Much effort has gone into trying to show that, although the work was speculative rather than experimental, Anaximander was not just engaged in arithmology. See also W. A. Heidel, "The Pythagoreans and Greek mathematics," in David Furley and R. E. Allen (eds.), *Studies in Presocratic Philosophy* (London 1970) 379 . The alternative line that this is a rationalisation of some mythic or poetic materials is proposed by M. L. West, *Early Greek Philosophy and the Orient* (Oxford 1971), 94; D. L. Couprie, "Anaximander's discovery of space," in A. Preus (ed.), *Before Plato* (Albany 2001) 23–48, 40–41.

[14] It is hard to find references that explicitly present this attitude as strongly as Barnes does in the passage cited above. Yet I think that the judgement is evident in the general approach to the study of the Presocratic philosophers and in the extent to which Pythagorean number theory is marginalized in main-stream collections of work on Presocratic philosophy. See the evidence presented by P. Kingsley, *Ancient Philosophy, Mystery and Magic: Empedocles and Pythagorean Tradition* (Oxford 1995) 317–320, showing how a tradition in intellectual history has tried to cleanse the early Pythagoreans of the mystical, by implying that it was a feature of a decadent, late, pseudo-Pythagoreanism, not the true philosophical period of Pythagoras and his early followers. That is not quite the pattern I am seeking to highlight here, but is related. See also G. E. R. Lloyd, *Early Greek Science: Thales to Aristotle* (London 1970) 26–7, "Secondly many of the resemblances that the Pythagoreans claimed to find between things and numbers were quite fantastic and arbitrary.... Obviously while the search for numerical ratios proved fruitful in such fields as the analysis of musical harmonies, and mathematics itself, it also and more often led to mumbo-jumbo and crude number mysticism"; and D. Furley, *The Greek Cosmologists* (Cambridge 1987) 58, who dismisses some parts of Pythagorean astronomy as fantasy, though he does this in the service of a more positive assessment of their particular emphasis on form and structure. See Huffman (above, n. 9) 271–2, for a survey of the bizarre ideas about the inhabitants of the moon, attributed to supposedly more "rational philosophers", that are quietly ignored in modern histories (while those attributed to Philolaus are taken to discredit the whole of his astronomy as mere fantasy).

grounded, fantasy about the relative sizes of the heavenly rings, he is hailed as a pioneer and an impressive forerunner of mathematical astronomy.[15] Of course, Anaximander lived a little earlier than Pythagoras, in the early sixth century rather than the second half of it. But really there is not a lot of difference in the dates, and we might suppose that by appealing to harmonic structures, Pythagoras was attempting to put more plausibility and accuracy into the speculative arithmetic, on the basis of his discoveries that related audible harmony to numerical proportions and the sizes of physical objects,[16] in place of whatever obscure patterns lay behind Anaximander's guesswork.

So it seems that when Anaximander indulges in *pure* numerical fantasy, plucking multiples of 3 and 9 apparently out of the air, he is hailed as the pioneer who saw for the first time that the plausibility of one's cosmological theory can be enhanced by showing that it makes mathematical sense. When Pythagoras, or early Pythagoreans, do a more sophisticated version of the same thing, selecting harmonic and geometrical sequences in preference to arbitrary patterns, they are accused of superstitious and fanciful numerological speculation. And yet the reason for positing harmonic ratios in nature is that harmonic ratios are found in nature, and are perceptible by us because we are naturally attuned, so that we find such ratios beautiful, when they occur.

Certainly, to suggest that the heavens manifest a harmonic structure which we find beautiful is not to engage in *empirical* science of quite the sort we are used to. But if we are in the business of *speculative* astronomy, rather than empirical astronomy, then Pythagoras (or whatever Pythagorean invented this idea) has at least as good a grounding for his approach as Anaximander seems to have. And if empirical support is a virtue, at least Pythagoras can point to his work on harmony, which evidently does have some empirical support.[17]

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[15] "The importance of this theory is that it is the first attempt at what we may term a mechanical model of the heavenly bodies in Greek astronomy"—Lloyd (above, n. 9) 17; "His theory of equilibrium was a brilliant leap into the realms of the mathematical *a priori*"—KRS 134. Recent fashion has been rather more low key in its estimate of Anaximander (e.g., "The beginnings of cosmology," in A. A. Long (ed.), *The Cambridge Companion to Early Greek Philosophy* (Cambridge 1999) 45–65, 55).

[16] See Xenocrates fr. 9 Heinze, apud Porphyry *Commentary on Ptolemy's Harmonics* 30 1–6 Düring.

Why, then, do we cite Pythagorean harmony theory as a type of worthless superstition, but cite Milesian science as an impressive forerunner of modern mathematical techniques in empirical science? Could it be that the idea that something is beautiful, or that there should be *music* in it, seems not to be a good reason for supposing it to be true? But if that is so, we need to examine our preconceptions. For it seems, first, that we are bringing to the enquiry a prejudice in favour of the idea that nature is random, disordered or arbitrary, rather than systematic, displaying patterns and orders at more than one level. Why should it not be more likely that harmonic patterns figure in the structure of the heavens? If so, the Pythagoreans have the better approach to the task than, say, materialists such as the atomists.

Secondly, it seems plausible to suppose, as I have suggested, that Anaximander too thought that the heavenly bodies uttered a flute-like whistle. Perhaps he, too, was moved by that thought in composing his theory about the sizes and shapes of the hoops that circle the earth. So that even if we do, sadly, start from a post-enlightenment prejudice in favour of seeing the world as random, meaningless and lacking in beauty, still there seems to be some inconsistency in our preference for the speculations of Anaximander over those of Pythagoras. Is that just because we don't happen to have any texts on the music of the spheres—or rather wheels—in Anaximander?

Moving on from Anaximander to Heraclitus, let us ask a different question, this time about *logos*. It has become customary in writing about Heraclitus to leave the word *logos* untranslated even when writing for a Greekless readership.[18] Alternatively translators look for a standard formulaic or non-committal translation (such as "account" or "principle")[19] in order to avoid giving any specific meaning to the term in any particular occurrence.[20] These high-minded practices have an unforeseen consequence, it seems to me. First they make the term *logos* stand out as something like a key concept, inviting us to think that Heraclitus has a theory of "the *Logos*". This is reinforced by the habit of adding the definite article in the English translation. The definite article is there in some, but not all, of Heraclitus' references to *logos*,[21] but it would not always be there, typically, in English even where it is normal in Greek (for instance if ὁ λόγος were translated by a term such as "discourse," 'language," "reason," "proportion," "rationality" or "logic," we would not put in a definite article at all, on any occasion of use, even if it were there in the Greek). But because we do not offer one of these translations, but leave it as *logos*, and because we therefore add "the" on every occasion even where it is missing in the Greek, we produce an unanticipated effect: the *Logos* becomes almost imperceptibly hypostasized, until before we have even observed it happening, we find it occupying, for us, a place that looks plausibly god-like, and at that point we are sorely tempted to identify it with the 'god' of B 67. What might well have looked like an immanent pattern in the behaviour of the world, if it had been properly translated, now takes on a metaphysical role instead, as a divine entity that explains or dictates the reciprocal patterns in the world. This seems to happen, at least in part, because our increasingly entrenched translation practices, and exegetical practices, irresistibly privilege the term *logos* and exalt it to become a term of art.

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[17] Two key texts are Xenocrates fr. 9 Heinze, apud Porphyry *Commentary on Ptolemy's Harmonics* 30 1–6 Düring; Aristoxenus fr. 77 Müller, in a scholiast on Plato *Phaedo* 108d, Greene p.15.

[18] R. Waterfield in the commentary in *The First Philosopher,* Oxford 2000; KRS; R. McKirahan, *Philosophy before Socrates,* Indianapolis 1994.

[19] "Account" in Barnes, *Early Greek Philosophy*, Harmondsworth 1987; T. M. Robinson, *Heraclitus; Fragments,*Toronto 1987; and Kahn, *H.*; "principle" in R. Waterfield in *The First Philosophers,* Oxford 2000. See also Long in this volume at n. 19.

Aside from the damage that this does to our understanding of Heraclitus, it also has a strange effect on our understanding of the relation between Heraclitus and Pythagoras. Since we now think of *Logos* as a kind of god in Heraclitus' system, we fail to notice how close is the resemblance between *Heraclitus'* interest in proportion and ratios and the same topics in *Pythagoreanism.* The failure to translate *logos*, the adoption of a special systematic pseudo-translation, and the addition of the definite article and capital letter as though the *logos* were an hypostasis or divinity, mask the links between the notion of *logos* and the notion of "harmony" in Heraclitus' thought. Harmony (as in the harmony of opposites) is also seen as a key concept in Heraclitus' thought, as it is in Pythagorean thought. So both Pythagorean thought and Heraclitean thought are constantly playing with the twin notions of ratio and harmony, and using these as their main explanatory concepts in natural philosophy. The Pythagorean resonances in Heraclitus would, of course, be much more apparent if Heraclitus' *logos* were read as "ratio" or "proportion," and the numerical significance of harmony were allowed to emerge in the context of both opposition (in Heraclitus B 8), of ratio (in B 49, 79, 82–3), and of measure, and limit, and "the unlimited" (in B 120, 94, 30,31 and 45). It is true that Heraclitus uses a wider range of terms for "limit" and "boundary"—including οὖρος (120), τέρματα (120), μέτρον (94), as well as the πείρατα of 45—so that even in the Greek we are not alerted very strongly to the link between these various fragments that are in several ways obsessed with measure and limits. By contrast, in Pythagorean sources we tend to find a kind of technical terminology—the ἄπειρα καὶ περαίνοντα of Philolaus, for instance, and the πέρας καὶ ἄπειρον of the first pair in Aristotle's table of Pythagorean opposites. This draws attention to the theme in the Pythagoreans more prominently than the *variatio* in the Heraclitean vocabulary does.[22] Still it remains undeniable that Heraclitus uses the idea of *logos* or proportion to bring order to the measured processes of the world, and that he draws connections between patterns of opposition and the idea of a cosmic harmony (hidden or otherwise).

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[20] The motives for both practices are, of course, admirable in their way, in so far as the translator tries to avoid imposing an interpretation by rendering the term one way rather than another, or concealing the same term under unrecognisable variant translations. I am not suggesting that there is a better solution, but rather that translation is inherently unsatisfactory.

[21] *Logos* occurs with the definite article in B 1, 2, 31b, 50; without in B 39, 45, 72, 87, 108, 115.

So while the Pythagoreans' attempts to put numbers on the patterns and proportions that they saw in the cosmos, and to link those numbers to geometrical and harmonic proportions, are easily dismissed as puerile fantasies by Barnes (and not just Barnes),[23] Heraclitus' mysterious *logos* is given a definite article, a capital letter, and hailed as an attempt to bring reason and order into a world of opposition and strife.[24] What is the difference? Is it that Heraclitus does not give us the *numbers* but only hints tantalisingly at the existence of measures and ratios (the sea returns "to the same measure as was there before it became earth", B 31)? And is it because the Pythagoreans tell us the numbers (that the number of the heavenly bodies is ten, for example), but we suspect that their choice of numbers is motivated by the desire for perfection, not the desire to save the phenomena? And of course, we ourselves would *never* countenance a practice of adjusting the observational results to comply with the predictions of mathematics and theory….

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[22] The impression that the Pythagoreans have a systematic technical terminology may be exaggerated because of the prominence of Philolaus as a prime source for Presocratic Pythagoreanism.

[23] I have used Barnes because he represents an extreme end of a certain kind of Anglo-Saxon tradition. Not all historians of Presocratic philosophy display such antagonism towards the Pythagorean school, so that my generalisations should be taken to have distinguished exceptions. I am happy for the reader to identify with me or with my opponents as he/she feels most at home.

[24] Barnes (above, n. 2) 59, is careful to warn us against taking the *logos* as a technical term and the key to Heraclitus's secrets, but he goes on (80–81) to allow that there may be a metaphysical *logos doctrine*, and to recommend that Heracli-

Or is it that (by tradition) we systematically translate out, or interpret out, the references to harmony and ratio in Heraclitus, so that we don't see them as number mysticism, because instead we interpret Heraclitus' interest in *logos* as a kind of monotheism—something in the tradition of Xenophanes in which a Zeus-like divinity is rationalised and demythologised to become an immanent physical regulatory principle in the world, a guiding principle that sees to it that we don't need to appeal to weird metaphysical structures or mystical number patterns. It seems that we try to see in Heraclitus a step on the route from Milesian materialism to post-enlightenment physics, and we therefore let him have his *logos* in the guise of personified reason—exalted, but not transcendent, much as Cartesian theism accounts for the existence and orderly functioning of a mathematically regular cosmos by assigning certain roles to a kind of "god" figure that is really not an object of cult or mystery at all.

It is salutary to take a look at what Sextus Empiricus has to say. He provides a lengthy analysis of the role of reason as a criterion of knowledge in the Presocratic philosophers, an analysis heavily coloured by the interests and concerns of Hellenistic epistemology. Having dealt with Anaxagoras ("the most physical" of the Presocratics)[25] he introduces the passage on the Pythagoreans thus:

> ὥστε ὁ μὲν Ἀναξαγόρας κοινῶς τὸν λόγον ἔφη κριτήριον εἶναι· οἱ δὲ Πυθαγορικοὶ τὸν λόγον μέν φασιν, οὐ κοινῶς δέ, τὸν δὲ ἀπὸ τῶν μαθημάτων περιγινόμενον, καθάπερ ἔλεγε καὶ ὁ Φιλόλαος, θεωρητικόν τε ὄντα τῆς τῶν ὅλων φύσεως ἔχειν τινὰ συγγένειαν πρὸς ταύτην, ἐπείπερ ὑπὸ τοῦ ὁμοίου τὸ ὅμοιον καταλαμβάνεσθαι πέφυκεν· … ἦν δὲ ἀρχὴ τῆς τῶν ὅλων

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tus be placed with the Milesian rational tradition, and sheltered from the pejorative term "mystic" (which is doubtless reserved for those who fall into the Pythagorean mire).

[25] Sextus Empiricus *Adv. Math.* 7.90.

> ὑποστάσεως ἀριθμός· διὸ καὶ ὁ κριτὴς τῶν πάντων λόγος οὐκ ἀμέτοχος ὢν τῆς τούτου δυνάμεως καλοῖτο ἂν ἀριθμός.[26]
>
> Sextus Empiricus *Adv Math* 7.92–3 (= DK 44 A29)[27]

Sextus goes on to provide six or seven further paragraphs of evidence in support of the claim that mathematical reason is the criterion for the Pythagoreans before proceeding to apply the same kind of treatment to Xenophanes, Parmenides, Empedocles, Democritus and Heraclitus.[28] It is no surprise (to us, at least) that Heraclitus too is said to make the *logos* a criterion of truth.[29] In Heraclitus' case it is not cashed out as mathematical reason—naturally enough, since that is supposed to be distinctively Pythagorean. Instead Sextus cites the sequence of fragments that we standardly use as the prime evidence for "the *Logos* doctrine" in Heraclitus.[30] So what do we do when we use this material? We accept, from this passage, Sextus's account of Heraclitus and his notion of the *logos*—this survives almost unscathed into our interpretation of several major and crucial moves in Presocratic thinking; but we completely ignore the bits about *logos* in Pythagoreanism, and its basis in number and the idea that like is known by like that leads to the idea that if the universe is numerically ordered, then our understanding of it will be similarly ordered as a mathematical kind of science.[31]

That bit—the appeal to a specifically mathematical type of calculation—is not *exactly* what we find in Heraclitus, although there are (as we observed) hints of a kind of thinking that invokes proportions and ratios in Heraclitus too.[32] But there is no reason to think that the addition of mathematics as a criterion of sound understanding of the world is a development that we should dismiss as mystical mumbo-jumbo, or despise as a fairy story, by comparison with the rather vaguer and more general notion of *logos* in Heraclitus. On the contrary, we should probably agree, nowadays, that cosmology requires not just a generic brand of "rational enquiry" but more specifically a *mathematically trained investigator*, whose criterion for whether he has reached something worthy to count as knowledge will be *whether the mathematics works*. So why should we think of Heraclitus as a model of Presocratic philosophy at its best, while dismissing Pythagorean theory as an embarrassing disfigurement of an otherwise pure stream of increasingly rational investigation? Surely it should be the other way around?

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[26] So that Anaxagoras said that the *logos* generally was the criterion. The Pythagoreans also say that it is the *logos*—but this time not the *logos* generally but the *logos* that is acquired from studies (mathematics?)—just as Philolaus also said—and that given that it contemplates the nature of the universe, it has a certain affinity with that nature, if like is by nature grasped by like… But number was the principle of the structure of the universe; hence the *logos* that is the judge of all things is not devoid of this power, and would therefore be called number.

[27] Text as in Huffman (above, n. 9) 199.

[28] S.E. *AM* 7 92–140.

[29] S.E. *AM* 7.126.

[30] That is, B 1 and 2.

[31] In defence of this selective use of Sextus's material, one might appeal to the fact that we do have genuine fragments of Heraclitus in which he *uses* the term *logos,* whereas there is no textual support for attributing that term in that sense to Philolaus. But we should notice that Sextus is talking in terms that are alien to the Presocratic discourse throughout, and this applies as much to his search for a criterion of truth in Heraclitus as it does in Philolaus. On the anachronism of the terms of the enquiry see Huffman (above, n. 9) 199–201.

Let me offer a proposal for what lies behind this widespread preference for the Heraclitean over the Pythagorean harmony theory. It is this. It seems to me that Barnes (as well as others who share his judgements) is following a tradition that prefers signs of materialism and reductionism over any kind of metaphysical or teleological picture. It is a tradition that sees the pure materialist reductionism of the atomists as the culmination and high point of the Presocratic achievement, and it assesses the contribution of earlier thinkers by how closely they approximate to that ideal—an ideal that is seen as a kind of no-nonsense physics, even if it has little ambition to provide genuine empirical support for its speculations.[33]

It is true that I have suggested that Heraclitus' *logos* gets hypostasized as "The *Logos*" with a capital letter, and in the process takes on a quasi-god-like role as the governor of cosmic processes. That might suggest that our admiration for Heraclitus is not because we see him as eliminating metaphysical and religious entities. But, as I suggested above, despite the theistic terminology, we tend to conceive of that move as somewhat reductionist, like Xenophanes's theological endeavours. On that reading of Heraclitus, "God" or "The *Logos*," just *is* the world, when all's said and done:

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[32] E.g., B 30, 31, 79, 82, 83.

[33] Barnes himself (above, n. 2) 343–4, 76–7, is careful to warn us against over-enthusiastically assimilating ancient atomism to modern science, and he points out many ways in which the atomism of Leucippus and Democritus raise problems that they cannot answer. But these warnings leave untouched the general sense that the atomists' theory is virtuous just in so far as it approximates to the ideal of modern science—so that ancient atomism is *not quite admirable* because it *does not quite live up to that ideal* in all respects.

> God is day, night, winter, summer, war, peace, hunger satiety…[34]

God *is* the processes that once seemed mysterious; but really (according to this version) they are not so much mysterious as regular, not unpredictable but reasonable. Reason, not religion, is the way to get control of the physical events, we understand. That is what we take Heraclitus to be saying, in his rather obscure and difficult way. So God turns out to be no more than our picture of how the world works to a predictable pattern. Harmony theory is then read not as a metaphysical thesis but as a materialist one.

Conceivably this is correct as an interpretation of Heraclitus. In support, one might notice the way in which Heraclitus appeals to the notion of measure in connection with specific physical processes that manifest this kind of proportionality—the notion that we find this *logos* in the quantity of sea that you get back when earth has been turned back into water (B 31), and that there are observable limits to the passage of the sun across the sky.[35] It seems that, no matter how little evidence Heraclitus gives for observing such regularities in nature, he does mean that the regularities in question are part of *nature*.[36] Similarly, to return to Anaximander's picture of the cosmos, those heavenly pipes seem to be substantial and very concrete material chariot wheels revolving in the sky, invisible only because they can't be seen for the mist. Anaximander too is giving us *material* explanations with numbers on them, not numerical explanations with no matter to do the work.

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[34] Heraclitus B 67.

[35] This is one traditional interpretation of the claim in B 94 that "the sun will not overstep its measures." The Derveni papyrus (which appears to combine what we used to know as B 3 and 94) opens the possibility that the measures are the sun's size (a foot across, B 3) rather than its tropics. See G. Betegh, *The Derveni Papyrus: Cosmology, Theology and Interpretation* (Cambridge 2004) 10–11. This alternative is also compatible with the traditional reductionist interpretation that I am sketching.

[36] Here perhaps we assume too readily that the image of the Erinyes in B 3 ("otherwise the Furies, ministers of Justice, will find it out") is just a picturesque metaphor to convey what we take to be a natural constraint on the behaviour of the sun. Again the Derveni papyrus, with its obsession with the daimonic, tells us that Heraclitus was not always read so rationalistically in antiquity (see previous note).

Pythagorean mathematics, by contrast, tries to make numbers *do the work*. If you're looking for an account of material and efficient causes in the cosmos, it's odd to point to numbers *as such*, as opposed to applying numbers to quantities of other things, quantities of some material stuffs or physical forces that could do the work. So *if* you conceive the Presocratic project as a project to suggest and improve explanatory factors that are to be invoked in the interests of a reductionist thesis about how the world works, numbers as such seem to be the wrong kind of thing.[37]

This post-enlightenment complaint is closely related to an objection made long since by Aristotle in *Metaphysics* N:

> οἱ δὲ Πυθαγόρειοι διὰ τὸ ὁρᾶν πολλὰ τῶν ἀριθμῶν πάθη ὑπάρχοντα τοῖς αἰσθητοῖς σώμασιν, εἶναι μὲν ἀριθμοὺς ἐποίησαν τὰ ὄντα, οὐ χωριστοὺς δέ, ἀλλ' ἐξ ἀριθμῶν τὰ ὄντα· διὰ τί δέ; ὅτι τὰ πάθη τὰ τῶν ἀριθμῶν ἐν ἁρμονίᾳ ὑπάρχει καὶ ἐν τῷ οὐρανῷ καὶ ἐν πολλοῖς ἄλλοις. … 1090a20–25
>
> οἱ μὲν οὖν Πυθαγόρειοι κατὰ μὲν τὸ τοιοῦτον οὐθενὶ ἔνοχοί εἰσιν, κατὰ μέντοι τὸ ποιεῖν ἐξ ἀριθμῶν τὰ φυσικὰ σώματα, ἐκ μὴ ἐχόντων βάρος μηδὲ κουφότητα ἔχοντα κουφότητα καὶ βάρος, ἐοίκασι περὶ ἄλλου οὐρανοῦ λέγειν καὶ σωμάτων ἀλλ' οὐ τῶν αἰσθητῶν.[38] 1090a30–35

Aristotle exonerates the Pythagoreans from any charges to the effect that they treat numbers as separate from sensible things or as intermediate between sensible things and forms.[39] But this is only because he takes it that they think that sensible things *are numbers*, which he thinks is, if anything, an even more peculiar idea, albeit one that avoids the problem of duplication of Platonic entities. Aristotle suggests that the Pythagoreans adopted this theory because they perceived that there were πάθη of numbers, such as harmonies, ratios and the like, which can be seen as numerical characteristics of things, and that these show up all over the place in astronomy and the other aspects of nature. Seeing those mathematical phenomena, he supposes, made the Pythagoreans go for the idea that things actually *are* numbers.

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[37] See Furley (above, n. 14) 52–3 for a brief discussion of this thought.

[38] But the Pythagoreans made things be numbers (because they saw many numerical effects existing in perceptible bodies) but not separate numbers, but things being constituted of numbers. But why so? Because the numerical effects exist in harmony in the heavens and in many other things. …On the one hand the Pythagoreans seem not to be liable to any charge on this matter (sc. separating the mathematicals). But in respect of making physical bodies out of numbers, making things that have lightness and heaviness out of things that have no heaviness or lightness, they seem to be talking about a different heaven and different bodies, but not the perceptible ones.

[39] The Platonists and Speusippus are under attack for a variety of modifications of the idea of numbers that are separate from *aistheta*.

Although the tendency to exclude Pythagorean speculations from the serious history of Presocratic philosophy comes from a tradition that is heavily indebted to Aristotle, and to Aristotle's reconstruction of early cosmology, it does not seem to me that the modern objections to Pythagorean numerology reflect quite the same motivation as Aristotle's bemused comments in *Metaphysics* N. Aristotle suggests that numbers aren't the right kind of thing to be the constitutive substance of things that have mass. Numbers don't have heaviness and lightness, so—he complains— you can't make things out of them. But Aristotle does not simply dismiss the Pythagoreans as stupid or muddled. Rather, he concludes that in some way they would have to be talking about something else, if their thoughts are to make any sense. They can't really be talking about things that have weight and so on at all. "They seem to be talking about a different heaven and different bodies, but not the perceptible ones."[40]

Aristotle's observations about whether people 'separate' numbers are pertinent here. In the case of Plato, he says, the theory allows that there *are* things that have physical mass, on the one hand, and then, on the other hand, there are ἀριθμοί that are χωριστοί – a separate realm of things that are not in the same category as the physical things that manifest the numerical effects. It is a two-world view. But among the Pythagoreans he does not find a two-world view. They neither separate numbers, nor make them intermediates.[41] Instead he finds that they have just one world, and since it is a world made of numbers, it should be the incorporeal one, although it is also the world of perceptible things. That is why Aristotle says that they seem not to be liable to any charge of separating numbers from the perceptible things.[42] For there is just one set of things, namely the numbers (which nevertheless in some way *are* the perceptible things).[43]

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[40] 1090a34–5. Aristotle is bemused because they talk as though they are explaining physical bodies, yet the elements they cite suggest that this can't be so. The word "seem" in this sentence suggests that he thinks that to make sense of what they are saying we need to adopt some hypothesis such as this.

[41] Cf. Aristotl. *Meta.* A, 987b27 καὶ ἔτι ὁ μὲν τοὺς ἀριθμοὺς παρὰ τὰ αἰσθητά, οἱ δ' ἀριθμοὺς εἶναί φασιν αὐτὰ τὰ πράγματα, καὶ τὰ μαθηματικὰ μεταξὺ τούτων οὐ τιθέασιν.

[42] 1090a30.

[43] Aristotle's comment at 1090a30 seems to conflict with the passage in *Metaphysics* A (987b11) where he tells us that the Pythagoreans have a notion compa-

So the Pythagoreans have just the one world, but it is apparently composed of what we (at least) regard as incorporeals. The result is that (as Aristotle observes) the Pythagoreans seem to be talking about a different world and different bodies, 1090a34. If things are made of numbers, then they are a very funny kind of "things".[44]

So Aristotle resists making the sort of objection that one might expect from a scientist, complaining that it is naïve and stupid to try to create bodies out of numbers, or that this is the wrong kind of matter to do the job. Instead, Aristotle seems to be saying that if their suggestion that the material is numbers is to make any sense, their question must have been different. They must have taken themselves to be explaining a world of incorporeal perceptibles, not the world of corporeal perceptible things that Plato was talking about, which he regarded as something quite separate from numbers.

Nevertheless, Aristotle is evidently assuming from the start that the Pythagorean project (including the appeal to numbers) was the same project as the Ionian scientists' project. He thinks that the question was how to explain the perceptible world in terms of its constitutive matter. Once the constitutive matter has been specified as non-separated numbers, Aristotle concludes that the Pythagoreans had some funny idea of the world. They were evidently explaining a rather incorporeal world, with all its entities composed of numbers; but he does not drop the idea that the Pythagoreans are to be assessed for their competence at reducing perceptible reality to explanatory components that are immanent and not transcendent.[45]

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rable to Plato's notion of μέθεξις. It seems that at 987b11 Aristotle is assimilating Plato and Pythagoreanism—a tendency that was to have a long subsequent history— by contrast with the careful attempt to draw distinctions between different kinds of Platonism about numbers in the passages in *Metaphysics* N.

[44] I have not questioned Aristotle's claim that the Pythagoreans made things "out of numbers," because I am interested in trying to explain what his objection to that thought is, and how it differs from our objections to the Pythagoreans' use of numbers in physics. It may well be that he was wrong to think that they meant that numbers were a material cause, despite the fact that he surely had access to the works of Philolaus and Archytas and had written extensively on them. For a diagnosis of Aristotle's mistake, and the evidence in Philolaus for what he really meant, see Huffman (above, n. 9) 57–64.

[45] The problem is surely only that Aristotle takes the reduction to be materialist in its outlook. Without that assumption the project to reduce ontology to a system of numbers is not self-evidently flawed. W. V. Quine entertains precisely this project and investigates what it lacks, if anything, as a serious candidate in a

From Incomprehension to Admiration

I have suggested that there are striking similarities between the Pythagorean concerns with number, ratio and harmony, and some of the material that has been regarded as pioneering and profound in Anaximander and Heraclitus. In asking why these moves should be considered important and profound in the latter cases, I have suggested that they meet with approval among modern scholars because the modern scholars are assessing the Presocratic thinkers for their progress in a sequence of developments in the direction of reductive materialist physics. Because they see the numerical patterns in the universe as immanent πάθη of things, and do not presuppose a set of theoretical entities that are 'numbers' with properties of their own, the numerical fantasies of these early Ionian thinkers are seen as an acceptable—or even progressive— part of that generally materialist project.

It seems to me that this evaluation of the early Greek philosophers displays an agenda that is built into our heritage of modern Presocratic scholarship. The agenda is very evident in Barnes, but that is only because he is particularly blatant about expressing his prejudices in outspoken terms. In practice he is following an existing tradition. One would say that the tradition was Aristotelian in origin— the rejection of fancy metaphysical entities, the down-to-earth preference for specifying that the world of particulars is what is real, the analysis of the Presocratics as engaged in diagnosing the material cause, all these seem to be Aristotle's prejudices— except that I think that it is a modern version of Aristotelianism that has acquired a great deal of baggage from the Enlightenment, from logical positivism and from a more recent scientism that equates truth with what can be proved by empirical methods. Aristotle is certainly opposed to some of the things that he finds in Platonism, such as the separation of Forms, but his opposition is not for quite the same reasons as the reasons that modern Presocratic scholarship would offer for why it doubts that Pythagorean numerology was a valuable contribution to Western Philosophy's overall development.

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number of works. See Quine, "Ontological reduction and the world of numbers," in id., *The Ways of Paradox and other essays* (New York 1966), 199–207; "Ontological relativity," in id., *Ontological Relativity and other Essays* (New York 1969) 26–68; "Propositional objects," in id., *Ontological Relativity and other Esays* (New York 1969) 137–60. I am grateful to Nick Denyer for pointing me to these references.

In this second part of the paper I shall move beyond my initial thought, that Pythagorean speculations are *no worse* than the comparable bits of Heraclitus or Anaximander, if one is looking for empirically verifiable reasons in favour of a particular theory. My second thought is more ambitious. I want to propose that there is something in the Pythagorean enthusiasm for numbers that is far more significant philosophically, and has had far greater ramifications in the story of Western philosophy than anything Anaximander or Heraclitus ever did, despite their superior credibility in the contemporary western system of values. That is, I am suggesting that we should not *apologise* for the Pythagoreans' tendency to idolise numbers, or certain particular numbers, nor should we try to *discard* those bits and look for some cleaner bits of respectable doctrine instead. Rather we should celebrate them.

A number of thinkers from Plutarch to Leibniz have anticipated my point. We should start however with a well known passage attributed to the fifth century Pythagorean Philolaus, which is quoted by Stobaeus.[46] The point that is relevant to my topic is where Philolaus says that without number it is not possible for anything to be thought or known:

> καὶ πάντα γα μὰν τὰ γιγνωσκόμενα ἀριθμὸν ἔχοντι· οὐ γὰρ οἷόν τε οὐδὲν οὔτε νοηθῆμεν οὔτε γνωσθῆμεν ἄνευ τούτω.[47]
>
> Philolaus B 4

The idea that “having a number” is a criterion of knowability is not one that is often proposed or given prominence in epistemological discussions, but it is worth comparing it to the point made by Parmenides about the relation between being and knowability:

> ταὐτὸν δ᾽ ἐστὶ νοεῖν τε καὶ οὕνεκεν ἔστι νόημα.
> οὐ γὰρ ἄνευ τοῦ ἐόντος, ἐν ᾧ πεφατισμένον ἐστιν,
> εὑρήσεις τὸ νοεῖν.[48] Parmenides B8.34–6

It seems that Philolaus is giving to numbers a role very similar to the role that is served by being and truth in Parmenides. There is no true thinking without being in Parmenides. There is no true thinking without numbers in Philolaus. It is a very severe epistemology, in which nothing counts as knowing unless it is knowledge of numbers. There is only one set of knowable objects, namely mathematicals, or at least numbered items. So study of mathematics is not just one of the sciences, alongside physics, but mathematics is the only science that relates effectively to knowable objects.[49]

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[46] Philolaus B 4–5; Stobaeus 1.21.7b-c.

[47] And indeed all the things that are known have number. For without this it is not possible for anything to be thought or known. Text from Huffman (above, n. 9).

[48] It's the same thing —thinking and that whose thought it is. For you won't find thinking without the reality, in which it is an utterance.

Secondly we may notice a quotation from Archytas (B 1) preserved by Porphyry in his commentary on Ptolemy's *Harmonics*, and the echo of the same thought that is known from Plato's *Republic:*

> παρακείσθω δὲ καὶ νῦν τὰ Ἀρχύτα τοῦ Πυθαγορείου, οὗ μάλιστα καὶ γνήσια λέγεται εἶναι τὰ συγγράμματα. λέγει δ' ἐν τῷ Περὶ μαθηματικῆς εὐθὺς ἐναρχόμενος τοῦ λόγου τάδε· Καλῶς μοι δοκοῦντι τοὶ περὶ τὰ μαθήματα διαγνώμεν, καὶ οὐθὲν ἄτοπον ὀρθῶς αὐτοὺς οἷά ἐντι περὶ ἑκάστου φρονέν. περὶ γὰρ τᾶς τῶν ὅλων φύσιος καλῶς διαγνόντες ἔμελλον καὶ περὶ τῶν κατὰ μέρος, οἷά ἐντι, ὄψεσθαι. περί τε δὴ τᾶς τῶν ἄστρων ταχυτᾶτος καὶ ἐπιτολᾶν καὶ δυσίων παρέδωκαν ἁμῖν σαφῆ διάγνωσιν καὶ περὶ γαμετρίας καὶ ἀριθμῶν καὶ οὐχ ἥκιστα περὶ μωσικᾶς. ταῦτα γὰρ τὰ μαθήματα δοκοῦντι εἶμεν ἀδελφεά.[50]
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> Porphyry *In Ptolem. Harm.* 1.3, p. 56, Düring (quoting Archytas B 1)[51]

This passage confirms Plato's claim, at *Republic* 530d, that the Pythagoreans called arithmetic, geometry, harmonics and astronomy 'sister' sciences, and it suggests that Archytas was the one who coined the phrase. But my interest is not in that point, but in Archytas's suggestion that one would expect the experts in these sciences – which are grouped together because they work by theoretical manipulation of abstracted mathematicals, not empirical data from physical bodies – one would expect *these* experts to be the ones who correctly discern the nature of things, and of the universe as a whole. It is οὐθὲν ἄτοπον, says Archytas, that these people think correctly about things. But notice also the idea that they do this καλῶς – they discern the workings of the universe *beautifully*. And this surely links in to the idea that the workings of the universe are themselves a fine object of attention.

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[49] See Huffman (above, n. 9) 173–7, responding to M. C Nussbaum, "Eleatic conventionalism and Philolaus on the conditions of thought," *HSCP,* 83 (1979) 63–108). I do not deny that Philolaus would probably allow that we can perceive musical intervals and other relations without knowing the formulae, but I am suggesting that when we *know* the formulae, the knowable things are the numbers, so that other things (ratios, harmonies etc) are knowable just in virtue of being numerical, or having numbers (and their numbers are what we know about them). This is to go somewhat beyond what is strictly justified by the text.

[50] And now let us set alongside the words of Archytas the Pythagorean, to whom the writings are most reliably attributed. He says in the work on mathematics, right at the beginning, the following: "The people who are versed in learned subjects (mathematics?) seem to me to discern beautifully, and there is nothing absurd in their thinking correctly about each of the things just what it is like; for, since they discern beautifully with regard to the nature of the universe as a whole, it is to be expected that they will observe beautifully about the particular things, just what they are like. They have handed down to us clear knowledge concerning the speed of the stars and their risings and settings, and about geometry and numbers, and not least about music. For these subjects seem to be sister-subjects."

[51] Text as in C. Huffman. *Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King,* Cambridge 2005.

That point is made more explicit by Plutarch in a passage in his *Quaestiones convivales:*

> πᾶσι μὲν οὖν τοῖς καλουμένοις μαθήμασιν, ὥσπερ ἀστραβέσι καὶ λείοις κατόπτροις, ἐμφαίνεται τῆς τῶν νοητῶν ἀληθείας ἴχνη καὶ εἴδωλα· μάλιστα δὲ γεωμετρία κατὰ τὸν Φιλόλαον ἀρχὴ καὶ μητρόπολις οὖσα τῶν ἄλλων ἐπανάγει καὶ στρέφει τὴν διάνοιαν, οἷον ἐκκαθαιρομένην καὶ ἀπολυομένην ἀτρέμα τῆς αἰσθήσεως. διὸ καὶ Πλάτων αὐτὸς ἐμέμψατο τοὺς περὶ Εὔδοξον καὶ Ἀρχύταν καὶ Μέναιχμον εἰς ὀργανικὰς καὶ μηχανικὰς κατασκευὰς τὸν τοῦ στερεοῦ διπλασιασμὸν ἀπάγειν ἐπιχειροῦντας, ὥσπερ πειρωμένους δίχα λόγου δύο μέσας ἀνὰ λόγον, ᾗ παρείκοι, λαβεῖν· ἀπόλλυσθαι γὰρ οὕτω καὶ διαφθείρεσθαι τὸ γεωμετρίας ἀγαθὸν αὖθις ἐπὶ τὰ αἰσθητὰ παλινδρομούσης καὶ μὴ φερομένης ἄνω μηδ᾽ ἀντιλαμβανομένης τῶν ἀιδίων καὶ ἀσωμάτων εἰκόνων, «πρὸς αἷσπερ ὢν ὁ θεὸς ἀεὶ θεός ἐστιν.»
>
> (Plat. *Phaedr.* 249c).[52]
>
> Plutarch *Quaestiones convivales* 8.2.1, 718E (= DK 44 A 7a)

The thought developed by Plutarch in this passage is supposed to go back to Philolaus in some sense,[53] and indeed it is faintly reminiscent of the passage from Sextus Empiricus which we noticed above,[54] where Philolaus was said to have claimed that one gets an affinity with the harmony of the universe from assimilation to mathematical knowledge. Here too, in Plutarch's passage, the thought attributed to Philolaus—or built upon Philolaus's foundations by Plutarch—is that handling numbers does something splendid for you.[55] And for Plutarch, the less empirical the science is, the better it is at this task. Plutarch supports this Platonist thought by reference to a legend according to which Plato is supposed to have raised objections to the method for duplicating the cube attributed (here) to Eudoxus, Archytas, and Menaichmus. The details of the mathematics are not immediately relevant for now (except perhaps to note that Archytas should be exempt from the criticism). [56] Plutarch's point is simply this: that we should not be attending to material examples. We should be handling numbers. That's how we get to think of incorporeals, he thinks… This is the Platonist thought: that we need to get close to God by escaping from perceptible things.

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[52] In all the so called (mathematical?) studies, the traces and images of the truth of intelligible objects are reflected, as in even and polished mirrors; and most of all geometry, according to Philolaus, being the source and mother-city of the other studies, leads the mind up and converts it, like a mind purified and released effortlessly from perception. Hence Plato himself criticised the followers of Eudoxus and Archytas and Menaechmus, who tried to divert the doubling of the cube to instrumental and mechanical devices, as though they were trying to obtain the two mean proportionals, however practicable, aside from rationality. For this is to destroy and corrupt the good of geometry, when it is dragged back to perceptible things and not carried up and not grasping eternal and bodiless icons—"those things closeness to which makes god always be god."

[53] The name Philolaus is not in the manuscript, but it is obtained by a plausible emendation of a corrupt reading φίλαον in the manuscripts.

[54] S.E. *AM* 7.92 (= DK 44 A 29).

Of course, Plutarch is feeding us Platonism served up on a bed of Philolaus. I'm not meaning to pretend that the importance or the significance of the Pythagoreans' devotion to the elegance of numbers was explicitly appreciated by them, at the time that they first developed their fascination. On the contrary, I want to suggest that it is with hindsight that we can see that this was one of the most profound and lasting legacies of Presocratic thought—the discovery of what we would call incorporeals. It is a point made by Plutarch, and by Plato too of course,[57] that learning mathematics and geometry helps us to turn our gaze "upwards" (meaning towards intellectual objects rather than corporeal or perceptible ones), or to abstract the intelligible objects and intelligible truths from material things. They are making a point about the usefulness of a particular kind of abstract discipline for intellectual exercise and training. But in addition to that point, I would also want to add that there is something important, even revolutionary, about the idea that the most important reality might be the one that obeys the mathematical rules, not the one that observably falls short, and approximates only rather rarely to mathematical accuracy. In other words, Plato saw that when mathematics talks about the πάθη that are numbers, it does not treat them as πάθη of things (that is, of things that are more real than their πάθη) but it treats the numbers as the most perfectly real things (or at least the more perfectly real, as compared with bodily things).

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[55] Huffman (above, n. 9) 193–194, takes the material from Philolaus to be very brief, only the reference to geometry as the source and mother city, while all the reflections on that are from Plutarch's Platonist context. On the other hand it is not clear why Plutarch would be prompted to cite Philolaus at this point if there were not *some* invitation to this line of thinking in the text to which he is alluding. I think that Huffman is keen to exclude any hints of proto-Platonism from Philolaus, and as a result he may be skimming the material too hard.

[56] There is something wrong with the story, though how exactly it has ended up in this form in Plutarch is not entirely clear. In fact, it would appear that Archytas's solution to the problem of obtaining the two mean proportionals was more theoretical and did not resort to practical methods as implied here. It makes no sense to suggest that Archytas was one of the offenders against whom Plato would have laid such a charge, therefore. The allusion does not seem to be to any existing text of Plato, although the issue of the need for two mean proportionals between cubic numbers figures in Plato's *Timaeus* 31c-32b, and there is a passage in the *Republic* 7.528a-d, which criticises stereometry for some failings that commentators have tried to link to the dispute mentioned by Plutarch. See Huffman (above, n. 9) 344–401.

[57] Plato *Republic* 527b.

This was an approach with which Aristotle was only partly out of sympathy. It is true that he does not think that the Platonic separation of mathematicals and forms from perceptible things is a good philosophical move. He prefers to think of the numbers as πάθη of bodies, and he is pretty sceptical of the weird results when (as he supposes) the Pythagoreans imagine that things just are numbers or made out of numbers. But the preference for the perfection of mathematics, and the location of genuine truth and beauty in the intelligible world, is less alien to Aristotle's way of thinking than it is to the agenda with which modern scholarship has approached the Pythagoreans—those prominent parts of modern scholarship which have been responsible for relegating them to the status of superstitious mystics.[58]

What do I mean? I mean that there is a seamless continuity between Pythagorean awe at the perfect patterns in number, Parmenides's awe at the eternity of Being, Plato's awe at the Form of the Good, and Aristotle's awe at the Unmoved Mover. All these are objects of love and admiration, but their power is derived entirely from their beauty and perfection, not from any efficient or material causal efficacy.[59] At the end of the day, Aristotle too would locate the best and most perfect causal power in the teleological cause, a cause discovered by abstract reasoning, not by experimental science. The reason why Aristotle found the Pythagoreans puzzling was because he thought that they must be looking for the material cause. He could not fit into his system a weird attempt to explain bodies that have mass by appeal to entities that have no mass; but his bemusement is created by the story that he has to tell about the development of Presocratic philosophy. Presocratic *phusikoi* are (he thinks) trying to answer the question "Out of what, ἐκ τίνος, did the world come?" (or "Out of what, ἐκ τίνος, is the world made?").[60] Aristotle glosses the "stuff," out of which they suppose the world comes, as their *arche*, and his account of his predecessors tends to be couched as an analysis of their various attempts to cope with the logical complexity of the notion of coming to be *out of something*, while supposing that the something in question was logically playing the role of the material substrate. So it makes sense that if he found the Pythagoreans saying that the ἀρχή is number (or saying what he took to be that claim), he would suppose that something very weird was going on. But it was only weird because he was looking at their ἀρχή as a material substrate. It is not at all weird if you place it alongside the formal causes of the Platonists, or the final cause that is so powerfully there in Aristotle. If, instead, you start by wondering whether the Pythagoreans are talking about the explanatory power of beauty, structure, form, and indeed teleology, in the universe, the idea of appealing to patterns of numbers makes much more sense.[61] If that was what they were doing, then their appeal to numbers as explanatory principles of the universe is not just methodologically sound, but also extremely perceptive.

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[58] There are, of course, notable exceptions in modern scholarship on the Presocratics. Most importantly perhaps, Carl Huffman, who has done much to bring the contributions of neglected Pythagorean thinkers such as Philolaus and Archytas to our attention in their own right, and show that they have serious philosophical and theoretical meat to offer. Others, including most prominently Peter Kingsley, have sought to show why the religious and mystical side of Pythagorean traditions needs to be taken seriously.

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[59] Some sources credit the Pythagoreans (Hippasus in particular) with the discovery of irrational numbers, or particularly the incommensurability of the side and diagonal in a square, and suggest that this was a challenge to their belief in the mathematical perfection of the universe. (Porphyry *Life of Pythagoras* 246–7; Clement *Stromateis* 5.58). But one might equally suppose that the fact that the side and diagonal are commensurable when squared (effectively Pythagoras's theorem) would reveal a hidden rationality, a virtual rationality, in numbers that were apparently irrational when treated as lines, and restore one's faith in the idea of a mathematically coherent universe.

[60] Aristot. *Meta.* 983b6–11; cf. *Phys.* 187a12–26.

[61] Indeed there is evidence that Aristotle was partially aware of this alternative construal, as for instance in his comments at Metaphysics N 1092b8, where he admits that it is not clear in what sense numbers are explanatory of being, and suggests (as the second alternative) that it is because harmony is (explained as) a ratio of numbers and that this idea extends to explanations of other things.

So I suggest that Aristotle's incomprehension might be created by his own agenda, which informs his investigation and presentation of the pre-Aristotelian history of ideas,—in other words, by that story that he tries to tell, of an investigation solely into material causes in the Presocratic period— but it does not reflect any ideological antipathy on his part to the possibility that there might be other worthy causes to investigate besides the material cause.[62] In modern thought the lack of appreciation for this pioneering work on numbers, which paved the way for all the most influential thinking from Plato to the Renaissance,[63] is due to something worse. It is due, I think, to a fundamental prejudice in favour of reductionism, materialism, and mechanistic conceptions of the physical world. It seems to me that, unlike Aristotle who thought that the Presocratics were *primitive* in trying to explain things by reference to matter alone, contemporary scholars assume instead that they are to be *congratulated* for exactly that. They think that *progress* was manifested in the Presocratics' move towards the more and more mechanistic theories of Anaxagoras and Democritus. They are *embarrassed* by Empedocles, and they often try to rescue him, by giving him one physical poem in which mechanistic forces explain everything and there are no appeals to immaterial values, so that they can conveniently ignore the other bits which don't fit that ideal. And they find themselves quite unable to stomach the Pythagoreans, when they discover that even abstract maths is imbued with ethical and religious value. "Mathematicians and philosophers just *shouldn't be talking about numbers with that kind of language*", I hear them say. "It's *superstitious*. It worries us."

The reason why we have come to think like that is because we have been brought up with an agenda that is more ideologically blinkered than Aristotle's. A deep set ideological preference for mechanistic theory prevents us from seeing that one might—one should—want to explain what is beautiful and awe-inspiring about the world; and that the explanation we give for beauty and wonder should *not explain it away,* in such a way that there is no awe and no beauty to move us after all.

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[62] My diagnosis of the source of Aristotle's incomprehension differs somewhat from Huffman (above, n. 9) 57–64. This is largely because Huffman thinks that Philolaus *was* investigating the corporeal world in the terms that Aristotle envisages (so Aristotle's mistake was in confusing the claim that things come from limiters and unlimiteds with the claim that they come from numbers). I am suggesting instead that Philolaus might indeed—nay surely did—assign a role to numbers in explanation, but not as a material explanation.

[63] It would be good to say something about Plato, and particularly about those bits of Plato that have been taken to be somewhat Pythagorean in inspiration (including parts of the *Phaedo*), but that will have to wait for a more substantial opportunity to treat it in its own right.

To encapsulate the point I want to make, and to remind ourselves that the prejudice against the Pythagoreans is not universal, we should look at a passage from Leibniz.

> It is rightly said in the paper given to the Princess of Wales, and which Her Royal Highness was kind enough to send to me, that next to vicious passions, *the principles of the Materialists* contribute much to support impiety. But I do not think that there were grounds to add that *the Mathematical Principles of Philosophy are opposed to those of the Materialists.* On the contrary, they are the same except that the Materialists, following in the footsteps of Democritus, Epicurus, and Hobbes, restrict themselves to mathematical principles alone, and admit nothing but bodies, whereas the Christian Mathematicians also admit immaterial substances. Thus it is not Mathematical Principles (in the ordinary sense of the term) but *Metaphysical Principles* which ought to be opposed to those of the Materialists. Pythagoras, Plato, and to some extent Aristotle, had some knowledge of these, but I claim to have established them demonstratively, although in my *Theodicy* this was done in a popular manner.[64]

There is a distinction to be made between the materialist way of doing numbers, which uses numbers to give exact accounts of the behaviour of bodies, and the metaphysical move, which admits immaterial substances. What the Pythagoreans give us, according to Leibniz, is the metaphysical, which is, I would claim, the origin of real philosophy. It wasn't Anaximander who started us moving towards real philosophy, nor Democritus, nor even perhaps Heraclitus. It was Pythagoras, and he did it when he told us to take our oaths by the *tetraktys*, and that justice is the number 4 and *kairos* is the number 7.[65]

Don't get me wrong. I am not trying to say that metaphysical theories are right, or that a metaphysical theory is better (as a theory) than a materialist one. I am just saying that we would not have had a history of western philosophy if there hadn't been Pythagoreans and Platonists: that the metaphysical turn (initiated or preceded by the numerical turn) is what is distinctive, and that is what first sets the debate about the nature of reality and the status of the perceptible world going. Parmenides does this, and the Pythagoreans do it, but the materialists don't.[66] And that is one reason why one might want to say that philosophy started in southern Italy, not on the coast of Turkey, and that Parmenides was, after all, an honorary Pythagorean.[67]

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[64] Gottfried Wilhelm Leibniz: *Correspondence with Clarke:* Leibniz's second paper, in G. W. Leibniz, ed. C. I. Gerhardt *Die Philosophischen Schriften von Gottfried Wilhelm Leibniz* (Berlin: Weidmann, 1890) vol. 7, p. 355. I am grateful to Lloyd Strickland who kindly supplied this new translation for me.

[65] Alexander *In Meta.* 38.10.

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[66] One feature of the prevalent view that presocratic philosophers were seeking mechanistic and materialist explanations is the assumption that all or most of the Presocratics were materialists in their metaphysics, and indeed that they had no notion of the incorporeal at all. This is not the place to develop a full defence of my claim that having a notion of the incorporeal is older and more ordinary than the idea that there are no incorporeal entities. I see no reason to suppose that it was *hard* for primitive thinkers to come up with an idea of non-bodily powers and causes: assuming that there are such powers and causes seems to me to be the norm in pre-scientific societies. I will develop this idea in relation to the Presocratics in two further papers, as yet unpublished.

[67] This paper was originally composed in 2005. The current version has not been heavily revised to address more recent work, but it has benefited from discussion with various audiences (in Samos and the B club in Cambridge in 2005, and the pure mathematics seminar at UEA in 2006). Extensive written comments from Carl Huffman on my first draft have been of immense value.

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2. Pythagorean Communities

From Individuals to a Collective Portrait

Leonid Zhmud

In the middle of his doxographical discussion of Presocratic theories, Aristotle makes an interesting psychological remark: "It is what we are all inclined to do, to direct our inquiry not by the matter itself, but by the views of our opponents" (*De caelo* 294b5). I think one can hardly find a better motto for the Pythagorean studies of the last two centuries. Most books on Pythagoras and early Pythagoreanism are highly polemical. This includes even such a paragon of objective research as Zeller,[1] for he, too, had his own target to attack, namely Röth's *History of Western Philosophy*,[2] which accepted the entire ancient tradition on Pythagoras as historically reliable. Zeller's critical approach to the sources razed Röth's construction to the ground, so that very little remained of Pythagoras. Incidentally, what has remained—the philosophical doctrine that "all is number," the astronomical theory of the spheres, and the concept of the Central Fire—has nothing in common with Pythagoras.

Admittedly, Zeller's approach *per se* is sound and his distinction between the classical and the later sources is indeed crucial. The problem, however, is that the classical authors did exactly what Aristotle said: they were guided not by the matter itself, but by the views of their opponents. Aristotle's own opponents were the Academics, and this fact had a great impact on his treatment of the Pythagoreans. No other Presocratic thinker was the object of such lively debate between philosophers as Pythagoras. Starting with Xenophanes (B 7) and Heraclitus (B 40, 81, 129), the entire fifth-century tradition concerning Pythagoras is polemical. This is one of the reasons why this tradition had much more to say about Pythagoras than about any other Presocratic thinker. The first book about a Greek philosopher was Democritus' *Pythagoras* (68 A 33.1). At the same time, around 400 BC, a Sophist from Miletus,

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[1] E. Zeller, *Die Philosophie der Griechen in ihrer geschichtlichen Entwicklung.*^{5} Vol. 1. Leipzig 1895.

[2] E. Röth, *Geschichte unserer abendländischen Philosophie*. Mannheim 1846.

Anaximander the Younger, wrote a book on the Pythagorean *symbola* (58 C 6). When the Academy created the monograph, the first genre of philosophical historiography, which is devoted to an individual thinker or a school, the first examples were Πυθαγόρεια by Xenokrates (fr. 2 Isnardi Parente) and *On the Pythagoreans* by Heraclides Ponticus (fr. 22, 40–41 Wehrli). Speusippus wrote a book *On the Pythagorean Numbers* (fr. 28 Tarán). In addition to the works about or against individual Pythagoreans, Aristotle wrote two special monographs: *About the Pythagoreans* (fr. 191–196 Rose), which contains a collection of the materials, and *Against the Pythagoreans* (fr. 198–205 Rose), which discusses their philosophical and scientific views.

In the next generation, Aristoxenus' works on Pythagoras and his followers draw an idealized picture of the philosophers, scientists, and politicians who lived according to their ethical principles.[3] This is not the picture that we find in Aristotle, or for that matter in Aristoxenus' biographies of Socrates and Plato, which are full of scandalous stories (fr. 54a, 62, 67 Wehrli). Much less prejudiced, Dicaearchus also highlights Pythagoras, Socrates, and Plato as the heroes of his biographical works and uses them to represent various forms of philosophical life.[4] In Eudemus' histories of mathematics and astronomy, the Pythagoreans are quite dissimilar to the Pythagoreans of Dicaearchus, though not directly opposed to them.[5]

Thus, even when restricting ourselves to the classical sources, we still get the same principal hypostases of Pythagoras found in modern scholarship. Pythagoras is seen as an amalgam: a religious and moral teacher, a politician, a philosopher and scientist, and the proportion of these qualities he is assigned seems to be a matter of a personal choice. Burkert[6] claims 90 % religion and 10 % politics with no science and philosophy, while van der Waerden[7] assigns 50 % religion and 50 % mathematics, whereas Riedweg[8] views this as 98 % religion and 2 % philosophy, with no scientific content. Now, I do not want to defend my own view of these proportions,[9] or if so, only in a very indirect way. Everyone who knows Carl Huffman's works on Philolaus and Archytas[10] would agree that they are by far not as polemical as, for instance, Burkert's book, or my own book. With respect to their subject matter, there are two obvious reasons for this. First, Huffman does not need to prove that Philolaus *was* a philosopher or that Archytas *was* a mathematician and a politician. Second, there is no Pythagoras in Huffman's books, for Huffman does not need him. I still have great difficulty in speaking about early Pythagoreanism without reference to Pythagoras,[11] even though everything about him appears to be highly disputable. In 1819, it was quite logical for A. Böckh to start his discussion of Pythagorean philosophy and science with Philolaus, for he believed he could find there the undeniable written evidence that either did not exist in the preceding period or was not so undeniable.[12] As we know, the case of Philolaus has proved to be more complicated than Böckh thought; it needed the joint efforts of many scholars to be settled. Yet it does not follow from this that the earlier period cannot be reconstructed. Since it seems that Pythagoras himself is the main obstacle to such a reconstruction, I am going to leave him alone for the time being and turn to a much less problematic matter, namely the Pythagoreans.

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[3] Περὶ Πυθαγόρου καὶ τῶν γνωρίμων αὐτοῦ (fr. 11–25), Περὶ τοῦ Πυθαγορικοῦ βίου (fr. 26–32), Πυθαγορικαὶ ἀποφάσεις (fr. 33–41), Ἀρχύτα βίος (fr. 47–50).

[4] S. White, "*Principes sapientiae:* Dicaearchus' biography of philosophy," in W. W. Fortenbaugh and E. Schütrumpf (eds.), *Dicaearchus of Messana* (New Brunswick 2001) 195–236.

[5] See L. Zhmud, *The Origin of the History of Science in Classical Antiquity*. Berlin 2006.

[6] W. Burkert, *Lore and Science in Ancient Pythagoreanism* (Cambridge, Mass. 1972).

[7] B. L. van der Waerden, *Die Pythagoreer: Religiöse Bruderschaft und Schule der Wissenschaft.* Zürich 1979.

Why are the school's followers in fact not as problematic as its founder? Well, because they are different from their master. Pythagoras pretended to possess supernatural qualities and was therefore the kind of person to whom legends, even originally unrelated legends, tend to be attached. Unlike Pythagoras, no historically known early Pythagorean is connected with anything supernatural, mystical, or superstitious in the reliable part of the tradition. The doctors Democedes and Alcmaeon, the Olympic victors Milon and Iccus, the botanist Menestor, the philosophers Hippon and Philolaus, and the mathematicians Hippasus and Theodorus all appear in our sources to be closer to Anaxagoras than to Empedocles. There is no evidence even for their belief in metempsychosis. They are as 'normal' as they can possibly be. It is their normality that has a strong appeal to me, for if these people were Pythagoras' students and followers, we can learn something important from them about him and the society he founded. If, furthermore, the Pythagoreans that we know of were not the superstitious ritualists who adhered to rules forbidding them to travel on main roads, use public baths, speak in the dark, step over a yoke, sit on a bushel measure, stir the fire with a knife, etc.,[13] then who were these ritualists? If they are nowhere to be found, we must abandon the idea that such Pythagoreans ever existed.

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[8] C. Riedweg, *Pythagoras. Leben, Lehre, Nachwirkung.* Munich 2002.

[9] L. Zhmud, *Wissenschaft, Philosophie und Religion im frühen Pythagoreismus.* Berlin 1997. See now an updated English version: *Pythagoras and the Early Pythagoreans*, Oxford 2012.

[10] C. A. Huffman, *Philolaus of Croton: Pythagorean and Presocratic,* Cambridge 1993; idem. *Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King,* Cambridge 2005.

[11] See L. Zhmud, "Some notes on Philolaus and the Pythagoreans," *Hyperboreus* 4 (1998) 243–270.

[12] A. Böckh, *Philolaos des Pythagoreers Lehren nebst den Bruchstücken seines Werkes* (Berlin 1819) 3–4.

To be sure, some of the Pythagoreans known to us did perform miracles of faithfulness for their friends, like Damon and Phintias (Aristox. fr. 31 Wehrli), but this is not a kind of miracle with which we should be concerned. Nor should we worry about the rather abnormal behavior of the Pythagorean athlete and general Milon: Aristotle calls him πολύφαγος, according to the late sources, he devoured about nine kilograms of meat a day and just as much bread and drank ten litres of wine.[14] Now, these stories are not just amusing anecdotes. Taken seriously, they reveal quite an important distinction. Milon, this Pythagorean of the Pythagoreans, behaves in exactly the opposite way to what could be expected of a true follower of Pythagoras. But how do we know what should be expected of a true Pythagorean? In other words: what sources do we use to create a composite image of a true Pythagorean? Are they the same as our sources on the individual Pythagoreans? No, they are not. If we collect everything that is known about the individual Pythagoreans and compare this with what is known about anonymous Pythagoreans, Pythagoreans as a particular collective identity, we get very different pictures. Sometimes even one and the same author produces a different picture: Aristotle's individual Pythagoreans differ radically from his Pythagoreans "in general," this time not in their behavior, but in their doctrines.[15] This is one of many reasons why we ought to be very cautious about referring to "the Pythagoreans" as a collective identity, for this is the very area of the classical tradition where we can expect to encounter the grossest distortions.

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[13] See Burkert *L&S* (above, n. 6) 166 ff.

[14] Arist. fr. 520 Rose (cf. *NE* 1106b3); Phylarch. F 3 *FGrHist*; Athen. 10.4.

[15] Zhmud *Pythagoras* (above, n. 9) 433 ff.

In the modern as well as in the ancient world, the stories told about a social, ethnic, or cultural minority are often quite different from the stories told about the individuals who constitute these minorities. Though it is not that the first are necessarily false and the second always true, the distinction between the two is quite important. If we proceed empirically, our collective portrait of the Pythagoreans should look more or less like a sum total of the traits common to all the individual Pythagoreans, as well as those specific traits which are irreducible to a common denominator. Certainly, οἱ Πυθαγόρειοι is often just a *façon de parler*, behind which the real figures are discernible, e.g., Archytas, who stands behind the Pythagoreans in Plato's *Republic* (530a–531c), or Philolaus, whose astronomical system Aristotle ascribes to some anonymous Pythagoreans (*De caelo* 293a18 ff.). But equally often, the collective Pythagoreans do not correspond to any known individuals, e.g., the Pythagoreans of Anaximander the Younger, or those of Aristotle's *Metaphysics*, or those of Aristoxenus' work Πυθαγορικαὶ ἀποφάσεις. In the last case as well as in Theophrastus' *Metaphysics* (11a27-b10), they are very much like the Platonists. One can dispute these examples and adduce others, but this hardly affects my general thesis: if actions or ideas allegedly peculiar to the collective Pythagorean identity do not find independent confirmation at an individual level, we will stay on safer ground by preferring individual to collective evidence. Accordingly, still more suspicious are those testimonies about the Pythagoreans in general which plainly *contradict* the evidence about individual Pythagoreans.

Some examples follow, beginning with the rules of conduct. The traditional sources on Pythagorean vegetarianism are divided.[16] Some say that Pythagoreans did not eat meat, others that they abstained from particular kinds of meat or particular parts of the animals. On an individual level, strict vegetarianism is not attested, whereas consumption of meat is. This means we should rather conclude that some Pythagoreans did eat meat, even if some others probably did not. Secondly, let us look at their doctrines. Aristotle, who was followed by Theophrastus, who was followed by the entire later tradition, persistently claims that the core of Pythagorean philosophy is that "all is number." We do not find this thesis held by any of the Pythagorean thinkers, though we find other Pythagorean ideas on number that differ both from the

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[16] Burkert *L&S* (above, n. 6) 180 ff.

Aristotelian version and from each other. I believe, therefore, that "all is number" is an Aristotelian interpretation of various Pythagorean philosophical and scientific ideas.[17] Thirdly, we look at institutions. The story that the early Pythagorean society was divided into *mathematikoi* and *akousmatikoi* seems to be ineradicable from the scholarly literature,[18] even though this story is found first in Porphyry (*VP* 37) and Iamblichus (*VP* 80–89), and even though the word μαθηματικός is first attested in Plato's *Sophist* (219c), whereas ἀκουσματικός is first found six centuries later, in Clement of Alexandria (*Strom.* 5, 59). There is obviously something persuasive about this story that has made it so enduring. Burkert, who once tried to show that it originated with Aristotle, now admits that this is impossible to prove.[19] Even if this story were a part of the fourth-century tradition, we would not find in the sixth or the fifth century any counterparts to the *mathematikoi* as they are described by Iamblichus and even less to the *akousmatikoi*. Should we believe that these people existed but left no individual trace, whereas their collective portrait was kept secret to be disclosed only by Porphyry? I think it is better to see this story for what it really is: as a construct of the Imperial age.[20]

Admittedly, the methodological individualism that I am professing is not entirely unproblematic. In a sense, it is easier to follow its alternative, definitional essentialism, i. e., to define and discuss specific Pythagorean qualities or theories. If we speak of the Pythagoreans in general, there is no need to bother about every individual Pythagorean: a deviant case can always be treated as an exception. However, if one starts from the individual level, every single Pythagorean counts. In this case, the question "who is to be counted as a Pythagorean and according to which criteria?" becomes crucial. This is not an easy question, and modern research offers widely differing answers. If one believes the late sources, the written Pythagorean tradition starts only with Philolaus, who lived a century after Pythagoras. Accordingly, the Pythagoreans before Philolaus did not write books, which means that those who did, e. g. Alcmaeon, Menestor, and Hippon, were not real Pythagoreans.[21] If one does not trust the late sources, but does trust Plato and Aristotle, the matter does not get any easier, for both of them avoided calling anyone a "Pythagorean." Neither Philolaus and his students in the *Phaedo*, nor Archytas in the Seventh Letter, are called Pythagoreans. Was Plato's teacher in mathematics, Theodorus of Cyrene (43 A 2), a Pythagorean or a friend of Protagoras? Of course, he could have been both, but Plato testifies only to the second. Obviously he had his reasons to be reticent. Aristotle's treatises are quite densely populated with anonymous Pythagoreans and to a lesser degree with individual Pythagoreans. He does mention by name Alcmaeon (*Meta.* 986a27), Hippasus (*Meta.* 984a7), Hippon (*Meta.* 984a4; *De an.* 405b2), Philolaus (*EE* 1225a30), Eurytus (*Meta.* 1092b10), and Archytas (*Meta.* 1043a21; *Rhet.* 1412a12; *Pol.* 1340b26), but he never tells us that they were Pythagoreans.

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[17] Zhmud *Pythagoras* (above, n. 9) 394 ff.

[18] See e. g. K. von Fritz, *Mathematiker und Akusmatiker bei den alten Pythagoreern. SBAW* 11, Munich 1960.

[19] Cf. Burkert *L&S* (above, n. 6) 192 ff.; id., "Pythagoreische Retraktationen," in W. Burkert et al. (eds.), *Fragmentsammlungen philosophischer Texte der Antike* (Göttingen 1998) 314–5.

[20] Zhmud *Pythagoras* (above, n. 9) 169 ff.

[21] So Huffman *Philolaus* (above, n. 10) 15–16.

If one looks not only to the ancient but to the modern authorities as well, the situation appears less dramatic. But in Diels and in the other modern collections of Pythagorean materials, we are faced with another problem: there are too many Pythagoreans. Partly this is because the selection criteria used are either not clear enough or not consistent. Diels does not explain his criteria for considering someone a Pythagorean, though he makes them quite visible, namely, by putting the evidence from Aristoxenus' catalogue of the Pythagoreans (Iamb. *VP* 267 = DK 58 A) at the beginning of part A. Except for one passing remark,[22] I have not found any explicit statements that he considered this catalogue to derive from Aristoxenus and thus to be evidence of primary importance, although this is certainly what he believed. Further, Diels does not always follow Aristoxenus. Thus, he places Cercops, Petron, Paron, and Xuphus among the early Pythagoreans, though their names are lacking in the catalogue. I think that he was wrong in all four cases.

According to Aristotle (fr. 75 Rose), the poet Cercops lived in Hesiod's time, so he could not have been a Pythagorean.[23] However, Epigenes, a grammarian of the Hellenistic age,[24] in his book *On the Writings Attributed to Orpheus,* calls Cercops a Pythagorean and ascribes two poems to him: Ἱερὸς λόγος and Εἰς Αἵδου κατάβασις (other authors attributed these poems to Pythagoras). This evidence is not very reliable.

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[22] H. Diels, *Antike Technik* (Leipzig 1924) 23.

[23] Burkert *L&S* (above, n. 6) 114, 130 n. 60; cf. DK 1.106.6–7.

[24] Clem. *Strom.* 1.21.131. On Epigenes, see L. Cohn, "Epigenes (16)," *RE* 6 (1907) 64–65; cf. I. Linforth, *The Arts of Orpheus* (Berkeley 1941) 110–11, 114 ff.

Orphic poetry was always pseudonymous and there was no way to figure out the names of its real authors. Epigenes' attributions must, therefore, have been guesswork, as was most of the other evidence of this kind. In Cicero the reference to Cercops is linked to a quotation from Aristotle, who claimed that there had never been a poet called Orpheus: *Orpheum poetam docet Aristoteles numquam fuisse et hoc Orphicum carmen Pythagorei ferunt cuiusdam fuisse Cercopis.*[25] Only the first part of this evidence derives from Aristotle (as is confirmed by a quotation from Philoponus), whereas the second part goes back to Epigenes.[26] Aristotle would not call Hesiod's contemporary "a Pythagorean"; more importantly, he never calls anyone "a Pythagorean."

We know about Petron (DK 16) only from a certain Hippys of Rhegium, whose testimony is quoted by the Peripatetic Phanias of Eresos; it is very likely that this is a forgery.[27] Paron (DK 26) owes his existence to Aristotle's mistake in taking the participle ΠΑΡΩΝ to be a proper name.[28] Xuphus (DK 33) is mentioned only once in Aristotle's *Physics* (216b22). In the commentary to this passage, Simplicius calls him a Pythagorean but it is impossible to verify his claim.

In Maddalena's and Timpanaro Cardini's works,[29] Epicharmus, Ion of Chios, Damon, Hippodamus, Polyclitus, Oenopides, and Hippocrates of Chios are considered to be Pythagoreans. This goes even further than Diels and is absolutely too far. Their names are not found in the catalogue and, moreover, no classical source considers any of them a Pythagorean or even a pupil of the Pythagoreans. Even if Oenopides or Hippocrates studied mathematics with the Pythagoreans, this fact alone does not make them Pythagoreans.

Of the fourth century Pythagoreans on Diels' list, another three have to be removed. Timaeus of Locri (DK 49) owes his existence to the Platonic dialogue and, later, to a Pseudo-Pythagorean text.[30] Ocellus of Lucania (DK 48) is mentioned in the catalogue, which means that Aristoxenus regarded him as a historical person, but all the doctrines ascribed to him are Pseudo-Pythagorean.[31] Lastly, the Pythagorean called Lycon (DK 57) is in fact four different people.[32] Since it seems unlikely that Lycon of Tarent, as mentioned in the catalogue (57 A 1), will be identified as being the same as the other three persons, what remains of him is merely a name. But we are not interested in mere names, for we have more then enough of them. We are looking for Pythagoreans with characteristic individual features that can be incorporated into our collective portrait.

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[25] Cic. *De nat. deor.* 1, 107 = Arist. fr. 7 Rose.

[26] W. Kroll, "Kerkops," *RE* 11 (1921) 314; Philop. *In de an.*, 186.21–2 = Arist. fr. 7 Rose.

[27] See *FGrHist* 554 F 5 with comm.; J. Kerschensteiner, *Kosmos: Quellenkritische Untersuchungen zu den Vorsokratikern* (Munich 1962) 209–10; L. Pearson, *The Greek Historians of the West* (Atlanta 1987) 108 ff.

[28] Burkert *L&S* (above, n. 6) 170; G. Martano, "Il pitagorico Parone o il pitagorico "presente"?," *Elenchos* 1 (1980) 215–224.

[29] A. Maddalena, *I Pitagorici*. Bari 1954; M. Timpanaro Cardini, *I Pitagorici: Testimonianze e frammenti*. Fasc. I–III. Florence 1958–64.

[30] H. Thesleff, *The Pythagorean Texts of the Hellenistic Period* (Åbo 1965) 202 ff.

Why is it so important to look for the sources that explicitly call someone a Pythagorean? Why not employ a doctrinal criterion, as is employed in the case of the other schools? Indeed, a Hellenistic philosopher can be regarded as a Platonist if he is known to belong to the Academy or to profess specifically Academic doctrines. The problem is that the Academy, the Lyceum, and the Stoa were institutionalized schools with definite sets of doctrines, even if different at different times. The Pythagorean school, in contrast, was founded neither as a philosophical school, nor as an institutionalised school at all, but as a political society, a ἑταιρεία.[33] Besides, Pythagoras' teaching was never written down and the school itself was dispersed both geographically and chronologically, more than any other Presocratic school. This is why we do not and should not expect to find anything resembling a Pythagorean orthodoxy. As long as the Pythagorean school was alive, i. e., up to the mid-fourth century BC, every Pythagorean philosopher developed his own views. Although there were certain similarities in thinking, it is difficult to identify one characteristic feature that was common to *all* Pythagorean thinkers. Interestingly, where we do encounter a Pythagorean orthodoxy, e. g., in the pseudo-Pythagorean literature, it is based on the Academic and Peripatetic interpretations of the Pythagorean ideas, not on the authentic Pythagorean tradition. Therefore the doctrinal criterion turns out to be of a limited value, though not invalid as such. For if we find a common view in the medical theories of Alcmaeon, Hippon, and Philolaus, this can confirm that they belonged to the same tradition, even if this view was not expressed by Hippasus and Theodorus, who were not interested in medicine.

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[31] Ibid., 124 ff.

[32] See *FGrHist* 1110, with comm.

[33] K. von Fritz, *Pythagorean Politics in Southern Italy,* New York 1940; E. Minar, *Early Pythagorean Politics in Practice and Theory* (Baltimore 1942) 19 ff.

Admittedly, in Pythagorean science, i. e., in the four *mathemata,* the situation looks different. There is such a common body of theories here, and there are many more affinities among the views of different scientists. Yet this consistency is not specifically Pythagorean; it is related to the methods of the respective science. Hippocrates of Chios developed Pythagorean geometry, Archytas solved the problem posed by Hippocrates, and Eudoxus studied geometry with Archytas, but neither Hippocrates nor Eudoxus were Pythagoreans. What *is* specifically Pythagorean in the exact sciences is the preoccupation with all four *mathemata*, including arithmetic and harmonics. Indeed, before Pythagoras (or, if you prefer, before Hippasus), theoretical arithmetic and mathematical harmonics did not exist; and after Hippasus, the Ionians—Oenopides and Hippocrates of Chios and to a certain degree also Democritus—developed only geometry and astronomy, not the other two branches of the *quadrivium.* This means, among other things, that Theodorus of Cyrene, who is mentioned in Aristoxenus' catalogue and who taught all four sciences (43 A 1, 4), was a Pythagorean and not just a friend of Protagoras. This means, furthermore, that Archytas' predecessors, whose knowledge of all four *mathemata* he praises at the beginning of his work (47 B 1), were the Pythagoreans, and not Hippocrates of Chios or the other Ionian mathematicians.[34]

This rather long digression was needed, I think, to make clear why the question that I raised earlier—about how a Pythagorean can be defined—should be settled on the basis of reliable classical sources. It is not enough that a person calls himself a Pythagorean, like Lycon, the critic of Aristotle, or the proto-Cynic Diodorus of Aspendus,[35] for this is evidence that they were not. But if someone was considered a Pythagorean by his contemporaries or by the Pythagoreans themselves, this means that he was judged by more complex and reliable criteria than we can employ now. This means that he shared with the other Pythagoreans not just one but many common features and at that it is these exact features that define a Pythagorean, both from an internal and an external point of view.

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[34] *Pace* Huffman *Archytas* (above, n. 10) 51 ff.

[35] Lycon (57 A 4); Diodorus (Tim. *FGrHist* 566 F 16; Hermipp. fr. 24 Wehrli = *FGrHist* 1026 F 26).

Now I come back to Aristoxenus' catalogue of the Pythagoreans. The first person to recognize that this catalogue, which is preserved in Iamblichus' *De vita Pythagorica,* may be by Aristoxenus was Erwin Rohde.[36] Diels, as I said, used this document for the Pythagorean chapters of his *Vorsokratiker*, but did not go into detail concerning it. Later, Burkert and Timpanaro Cardini briefly commented on the catalogue,[37] suggesting that it is based on genuine historical, probably documentary, evidence, given that a list of 218 names organised according to 27 cities and nations was not the kind of information that could be transmitted orally. A number of parallels between fragments of Aristoxenus and the catalogue make his authorship quite certain. The evidence Aristoxenus relied on most probably came from those last Pythagoreans with whom he was in contact, namely Xenophilus, Phanton, Echecrates, Diocles, and Polymnastes, the students of Philolaus and Eurytus (fr. 19 Wehrli). Another source of information on the Pythagoreans was his father Spintharos, who belonged to Archytas' circle; he is twice mentioned in Aristoxenus' biographical works (fr. 30, 54a Wehrli).

What is meant by "documentary evidence" is not a formal membership list of the Pythagorean society: such a list barely existed, if only because there was never a centralized Pythagorean community. Aristoxenus' list can be regarded rather as a reflection of the collective Pythagorean memory concerning the prominent Pythagoreans of the sixth, the fifth, and the early fourth centuries – prominent not necessarily in philosophy or science, but also in politics, or athletics, or medicine. They were prominent members of Pythagorean communities, dispersed throughout the entire Greek world from Cyrene in Africa to Cyzicus in Asia Minor. Some of them came from different cities to study with a master, be it Pythagoras, Philolaus, or Archytas, but most of them, I assume, remained in their own cities. Of the 218 Pythagoreans on Aristoxenus' list, only about 60 are mentioned in any other sources; the rest are no more than names. Moreover, we only have information that is of any use on about half of this small group of 60. The largest group on Aristoxenus' list (48 names) are all from his home city Tarentum; the smallest (2 names) from Katana. There are only eight Pythagoreans in the catalogue who have no colleagues in the same city, and of these eight at least three are rather dubious figures. I would like to point out here that we should approach Aristoxenus' list critically, like any other historical document, especially taking into account that it comes from Iamblichus, who lived 600 years later. Though it does not contain the names of the individuals who lived after Aristoxenus, it is possible that some of the famous names on the list were added later, after Aristoxenus. Being on the list does not guarantee that the person in question really was a Pythagorean. In several cases, doubt remains and on occasion there is evidence to warrant deleting a person from the list. However, if there is no evidence to this effect, we can consider the data of the catalogue to be a sufficient proof that the person in question can be seen as a Pythagorean.

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[36] E. Rohde, "Die Quellen des Iamblichus in seiner Biographie des Pythagoras [1871]," in id., *Kleine Schriften*. Vol. 2. (Tübingen 1901) 171.

[37] Timpanaro Cardini (above, n. 29) 3.38–9; Burkert *L&S* (above, n. 6) 105 n. 40. See also Zhmud *Pythagoras* (above, n. 9) 109 ff.

Though it is our most important document, the catalogue is by far not the only one. Theophrastus mentions Hicetas of Syracuse (50 A 2), who is not on the list, whereas his compatriot Ecphantus is wrongly placed among the Pythagoreans from Croton (DK I, 446.11). Pythagoras' contemporary, the famous Crotonian doctor Democedes, who married a daughter of the Pythagorean athlete Milon (Hdt. 3, 127–137 = 19 A 1), is not on the list either. Obviously, in the course of catalogue's transmission, some names have been lost. For example, Aristoxenus' father Spintharos is absent, as well as Amyclas, though Aristoxenus mentions both him and his friend Cleinias (fr. 131 Wehrli), who is on the list. Absent from the list are also Philolaus' students Simmias and Cebes (44 A 1a, B 15). The name of Parmenides' teacher, the Pythagorean Ameinias, appears only in the Hellenistic biographer Sotion (D. L. 9.21 = 28 A 1). These significant names need to be added (as "pluses") to the catalogue.

On the other hand, the catalogue contains some names that clearly should be removed—"minuses." For example, there are the ancient lawgivers Zaleucus of Locri and Charondas of Catane, who seemed to be associated with Pythagoras by the Pythagorean communities in Locri and Rhegium as early as the fifth century. This means that Aristoxenus' sources (fr. 17, 43 Wehrli) reflect a respectful but unreliable historical tradition. Another famous duo are the miracle-workers, Aristeas and Abaris. Aristeas of Proconnesus, a shadowy figure from the late seventh century BC, was the author of the *Arimaspea*, a poem describing his journey in search of the Hyperboreans. During his lifetime, Aristeas disappeared twice, and, according to Herodotus (4, 13–15), after the second time, he reappeared 240 years later in Metapontum and told the citizens to set up an altar to Apollo and dedicate a statue to himself.

In the catalogue, he is duly registered among the Pythagoreans from Metapontum. Abaris, the mythical priest of Apollo and the expert on the Hyperboreans, is listed in the catalogue as the only representative of these legendary people. As Bolton showed, Aristeas and Abaris were associated with Pythagoras in the fifth-century legendary tradition and later in Heraclides Ponticus' fantastic dialogues,[38] so that Aristeas' miraculous powers, such as bilocation, were transferred to Pythagoras. Thus, in this case too, the legendary and the historical tradition overlap.

Parmenides and Empedocles are also the sole representatives of their cities. There seem to have been no Pythagorean communities in Elea and Agrigentum, which means that in this case we can speak only of the Pythagorean teachers of Parmenides and Empedocles. In the biographical tradition, both of them appear as students of the Pythagoreans.[39] This could be the reason for including them in the catalogue, although we do not know whether this attribution came before or after Aristoxenus. The influence of Pythagorean ideas on Parmenides and Empedocles is undeniable, but both these philosophers are too independent and significant to be seen as completely integrated into Pythagorean tradition. Rather, they should continue to be considered as Pythagorean sympathizers. The next and the last name to be removed is Melissus, who is named together with five other Pythagoreans of Samos. If there was a Pythagorean community on Samos, he could have been a member even if, in terms of philosophy, he followed Parmenides and Zeno. But to be certain we should strike him from the list, for there is no need to be greedy.

After all these additions and subtractions, we can begin to make a preliminary analysis. The first four generations of Pythagoreans (i.e., people born between 560 and 470 BC) with, at least to some extent, discernible personalities can be placed in the following overlapping categories. First, the politicians, the largest category, containing the majority of the names in the catalogue. Among the most prominent of them was Milon, who won a battle against Croton's neighbour Sybaris around 510 BC.[40] This victory made Croton the dominant city in Southern Italy and, as the coins show, the neighbouring Pandosia, Temesa, and

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[38] J. Bolton, *Aristeas of Proconnesus* (Oxford 1962) 151 ff.

[39] Empedocles (Alcidam. *ap.* D. L. 8.56 = 14 A 5; Theophr. 227 A FHSG = 31 A 7; Tim. *FGrHist* 566 F 14); Parmenides (Sotion *ap.* D. L. 9.21 = 28 A 1).

[40] Diod. 12.9.2–10,1; Strabo 6.1.12–13 (both from Timaeus).

Kaulonia also became the dependent "allies" of Croton.[41] The conquering of Sybaris caused a conflict within the ruling Crotonian aristocracy, which led to Pythagoras' flight to Metapontum. Aristoxenus describes this conflict as a plot against Pythagoras, who had once refused the rich aristocrat Cylon admittance to the Pythagoreans and thus made him his enemy (fr. 18 Wehrli). Aristotle confirms the personal rivalry between Cylon and Pythagoras and mentions another rival of Pythagoras, Onatas (fr. 75 Rose), who is listed among Crotonian Pythagoreans (DK I, 446.13). As the arch-enemy of Pythagoras, Cylon is not on the list, but if he really was the Crotonian exarch of the Sybarites, as Iamblichus says (*VP* 74), he must have been a Pythagorean.[42] Anyway, we know that political conflict also took place within the Pythagorean society: Hippasus, for example, sided with Pythagoras' enemies, while Democedes remained Pythagoras' supporter (Iamb. *VP* 255 f. = 18 A 5).

In the case of Hippasus and Democedes, we have two prominent Pythagorean intellectuals who were politically active, as good citizens were supposed to be. Milon was very successful both in politics and in athletics, which leads us to our second category of Pythagoreans: the athletes. From 532 to 488 BC, Croton achieved an extraordinary series of victories in the Olympian Games.[43] The catalogue gives us the names of four Olympic victors: Milon, Astylos, Dicon, and Iccus (DK I, 446.14. 20. 28, 447.14). There is no doubt that there were many more. And there is no need to prove the importance of athletics for the ethos of the ruling Italian aristocracy. We can safely assume that many of the Pythagorean athletes were also politically active, as was the case with Milon. Athletics was connected with the aristocratic way of life, but it was also closely linked to medicine.

This brings us to our third category, the doctors. This group is smaller than the politicians, but is a very important group for our understanding of the role of the natural sciences in ancient Pythagoreanism. Iccus of Tarent won in the pentathlon in 476 BC and later became an athletic coach and famous doctor (DK 25). He specialized in dietetics and gymnastics and won Plato's praise for his wisdom and temperate way of life. Democedes (19 A 1) and Alcmaeon were two other prominent representatives of the Crotonian school of medicine, which stressed the importance of dietetics and gymnastics in maintaining good health.[44] The botanical book of Menestor was related to medicine (DK 32), just as were the natural-philosophical writings of Alcmaeon (24 A 1, B 4) and later, those of Hippon (38 A 11).

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[41] Von Fritz *Pyth. Politics* (above, n. 33) 80 ff.; Minar (above, n. 33) 36 ff.

[42] Minar (above, n. 33) 69–70; M. Giangiulio, *Ricerche su Crotone arcaica* (Pisa 1989) 311 n. 52; M. Bugno, *Da Sibari a Thurii: La fine di un impero* (Naples 1999) 41–2.

[43] C. Mann, *Athlet und Polis im archaischen und frühklassischen Griechenland* (Göttingen 2001) 164 ff.

Our fourth category is natural philosophers, *physikoi*, according to the Aristotelian terminology. Here we have Alcmaeon, Brontinus (one of the addressees of Alcmaeon's book; 24 B 1), Hippasus (18 A 1, 12), and Menestor. Among those born around 480–470 BC, there are two other *physikoi*, Hippon and Philolaus.

The fifth category is *mathematikoi*, i.e., people concerned with any of the four *mathemata* or with all of them. Strangely enough, we know the names of only two mathematicians from the first 100 years of the Pythagorean school: Hippasus (18 A 4, 14–15) and Theodorus (43 A 3–5). There is no doubt that there were many more, because by the time when Oenopides and Hippocrates of Chios were active, i.e., about 450–430 BC, the bulk of the first four books of the future *Elements* of Euclid had already been written,[45] which was an impossible feat for only one or two people. Regrettably, we cannot identify the other *mathematikoi*. For example, Parmenides' teacher Ameinias could have been a *physikos,* or a mathematician, or both. Alcmaeon was interested in astronomy (24 A 4, 12), but certainly was not a *mathematikos*. Philolaus fits this term much better, especially as an astronomer and a specialist in harmonics (44 A 16–21, B 6).

So far we have identified fourteen prominent Pythagoreans belonging to five overlapping categories. Now, let us imagine that we know nothing about Pythagoras himself and all we have is a collective portrait of his students and followers and the students of these followers. What would an individual portrait of Pythagoras look like if we had to construct it solely on the basis of the available collective portrait? I believe it would be both natural and legitimate to assume that he had something to do with activities that, already during his lifetime, became so distinctive to the Pythagorean society. Surely, we should not expect a perfect match, because for all his πολυμαθία (Heracl. 22 B 40) and πολυτροπία (Antisth. fr. 51 Caizzi), Pythagoras could not have been involved in all these activities. But he would certainly have worked in some of these fields and encouraged others.

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[44] See Zhmud *Pythagoras* (above, n. 9) 347 ff.

[45] E. A. Neuenschwander, "Die ersten vier Bücher der Elemente Euklids," *AHES* 9 (1973) 325–380.

Where, then, is the other side of Pythagoreanism: religion, magic, mysticism, shamanism, ritual taboos, and so on? If Pythagoras was a guru, as Riedweg suggests, where have all the other gurus gone? Did I leave someone off the list? No, I did not. Then, could it be that Aristoxenus' rationalistically-minded teachers struck all the gurus off the list? I do not think so. In fact, they added two miracle-workers, even though one of them, Aristeas, lived a century before Pythagoras, while the second, Abaris, was legendary. The only other guru on the list would be Empedocles, if we concede that he was a Pythagorean. There was also Brontinus (DK 17), who was regarded by Epigenes as the author of two Orphic poems, namely, Πέπλος and Φυσικά (DK 15). In the mid-fifth century, Ion of Chios asserted that Pythagoras was the author of some Orphic poems (36 B 2), and his remark trigged all the further attributions. It is misleading to present the early Pythagorean society as a kind of workshop specialized in producing Orphic poems, as West did.[46] The more we know about Orphism, the more visible its profound difference from Pythagoreanism becomes apparent. But even granted that Brontinus was the author of some religious poems, this did not prevent him from being a doctor, or a natural philosopher, or a politician, as shown by the case of Empedocles.

Speaking about Empedocles in more appropriate ancient terms, he was not a guru, but a "divine man," θεῖος ἀνήρ,[47] exactly like Pythagoras before him. However, in contrast to Empedocles, of whose followers we know nothing, Pythagoras founded a political society that outlived him for at least fifty years and a school that existed till the mid-fourth century. Both Pythagorean politicians and Pythagorean philosophers and scientists took from him what they were interested in and what they valued most. Incidentally, these interesting and valued things did not seem to include magic, mysticism, and a variety of ritual taboos; at least, taboos are not attested at all on the individual level and quite poorly at the collective level. Herodotus says that Orphics and Pythagoreans did not bury people in woollen clothes (2.81). There were some other attested taboos, for example, the prohibition of certain kinds of meat and fish (Arist. fr. 194 Rose), or beans (cf. Emped. 31

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[46] M. L. West, *The Orphic Poems* (Oxford 1981) 7 ff.

[47] For important qualifications of this notion, see D. S. Du Toit, *Theios Anthropos,* Tübingen 1997.

B 136–141), although we do not really know how rigorously these rules were observed. Anyway, there was nothing to fire the imagination in these regulations and nothing that would make a religious sect of the Pythagorean society.

What is then the basis for the widespread idea of a Pythagorean sect?[48] Putting aside Iamblichus' *akousmatikoi*, it is the Pythagorean *symbola*, attested first in Anaximander the Younger (58 C 6) and after him in Aristotle (fr. 194–196 Rose). If the *symbola* were strictly followed and if they constituted that very "Pythagorean way of life" that was approvingly mentioned by Plato (*Res.* 600a), then the Pythagoreans were indeed superstitious ritualists and their society was a sect. There are plenty of reasons, however, why this cannot be the case. It is anachronistic to speak of a "sect" in archaic Greece. There were no sects at this time; there were other religious and cultic communities, like θίασοι or ὀργεῶνες. Pythagorean society was neither of them, it was a political ἑταιρεία. At no time do we know of any specific Pythagorean cults or deities; their religion was the traditional *polis* religion. Pythagoras' only known religious innovation was metempsychosis, but even this was borrowed from Orphism along with several prescriptions that follow from this doctrine. The so-called Pythagorean *symbola* contain almost a hundred prescriptions that are hard to understand and much harder to follow.[49] If we compare them to the strictest charters of the real religious communities, like the Jewish Essenes or the early Christian monastery of St. Pachomius, we immediately see the difference between religious discipline and religious folklore. Neither the Jewish nor Christian charters contain any nonsense: every rule is clear and quite logical in the given environment; all of them are enforced by various punishments for those who fail to follow them, so that we can see a real, even though severe, life behind them. What kind of life stands behind the *symbola?*

> To take the *acusmata* seriously means an almost frightening constriction of one's freedom in daily life. Whether a Pythagorean gets up or goes to bed, puts his shoes on or cuts his nails, stirs the fire, puts on the pot, or

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[48] W. Burkert, "Craft versus sect: the problem of Orphics and Pythagoreans," in B. F. Meyer (ed.), *Jewish and Christian Self-Definition*, Vol. 3 (London 1983) 1–22.

[49] On *symbola,* see: C. Hölk, *De acusmatis sive symbolis Pythagoricis,* Diss. Kiel 1894; F. Boehm, *De symbolis Pythagoreis* (Diss. Berlin 1905); A. Delatte, *Études sur la littérature pythagoricienne* (Paris 1915) 271–2; Burkert *L&S* (above, n. 6) 166 ff.

> eats, he always has a commandment to heed. He is always on trial and always in danger of doing something wrong.[50]

To appreciate this impressive but anachronistic picture properly, it is crucial to understand that none of its elements correspond to the stories told either about individual Pythagoreans or about Pythagoreans in general. This picture emerges only if we put together all the *sayings* contained in the *symbola* that were collected by Anaximander. But in interpreting sayings, we are dealing with folklore, not with reality. There is no doubt that Anaximander dealt with folklore too, for he did not describe the *way of life* of any (named or anonymous) Pythagoreans. He collected what he took to be the "Pythagorean" sayings and maxims and interpreted them *allegorically*, i. e., according to one of the methods of literary criticism available at that time.[51] If he knew of a real Pythagorean who did not break bread or step on nail parings, why did he interpret these taboos allegorically? Aristotle believed that the taboos were originally literal (fr. 195 Rose), which seems very plausible, but he too had never heard of a Pythagorean really observing them. Except for a few dietary prescriptions and burial customs, all the other taboos appear only in the context of interpreting "Pythagorean" *sayings*. Nobody would claim that by interpreting the sayings of Solon or any other of the Seven Sages one could get closer to them as historical figures. It is clear that making this distinction between folklore and historical reality is a vital condition for the study of Pythagoreanism.[52]

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[50] Burkert *L&S* (above, n. 6) 191.

[51] He also interpreted the Homeric poems allegorically (Xen. *Symp*. 3.6)

[52] See Zhmud, *Pythagoras* (above, n. 9) 192 ff.

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3. Aristotle on the Pythagoreans

His Sources and his Accounts of Pythagorean Principles[1]

Richard McKirahan

Aristotle's importance as a source on early Pythagorean thought is both obvious and problematic. It is obvious because of his serious interest in the thought of his predecessors (including the Pythagoreans), because he provides far more information about the Pythagoreans than earlier authors do, and because he lived before the contaminating effects of Neopythagorean interpretations and reconstructions of the history of philosophy.[2] It is problematic because he interprets the Pythagoreans through the lenses of his own philosophical concerns and his own theories, because his theories and his approach make him unreceptive and unsympathetic to Pythagorean ways of thinking, and because he does not name his sources. I am going to take up some issues in these problematic areas. Specifically, I want to discuss his relation to his sources, whether it is likely that he based his account of the Pythagoreans on only one source: Philolaus in particular. I will present a case for a plurality of sources and will explore some implications of this thesis for Aristotle's accounts of Pythagorean principles.

It hardly needs to be said that I have written this paper with Carl Huffman in mind. He has presented a strong case that Philolaus is Aristotle's principal source,[3] and it is with due respect that I advance a dissenting view. I have not, however, written this paper mainly as a rebuttal of his arguments. Instead, after an introductory section (Section 1), I present some passages which prove beyond reasonable doubt that he used more than one source in some of his discussions of Pythagorean doctrines (Section 2). I then present some of Aristotle's claims about Pythagorean principles, particularly those that have to do with numbers (Section 3), and the fragments of Philolaus that bear on principles (Section 4),[4] with a preliminary discussion of the relations between the Aristotelian material and Philolaus (Section 5) and some chronological considerations that support the likelihood that Aristotle had access to other sources than Philolaus' book (Section 6). I then translate and comment on four passages from the *Metaphysics* that provide Aristotelian context for many of the doctrines he ascribes to the Pythagoreans and give important clues about how he understood those doctrines, and whether they can be fitted into a coherent ontology (Section 7). Next I return to the claims of Section 4 and attempt to determine which of them are authentic Pythagorean views and which are Aristotelian interpretations (Section 8). On the basis of the claims I find to be authentic, I offer a brief sketch of a way Pythagorean thought on principles may have evolved down to the time of Philolaus (Section 9). In the final substantive part of the paper I turn to Aristotle's treatment of Pythagorean principles and attempt to account for his evident frustration and lack of sympathy with their views. I suggest that Aristotle's difficulty in making sense of that aspect of Pythagorean thought is due to a fundamental difference between his way of approaching philosophical issues and theirs (Section 10).

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[1] This paper is a substantially rewritten and expanded version of my conference presentation. I want to thank the other participants whose comments, objections, and conversation drew my attention to some points in the conference presentation that needed further thought and elaboration. Except for the translations taken from the second edition (2011) of my *Philosophy Before Socrates* and a few other small changes, the paper is identical with the version originally submitted for publication in 2005.

[2] See W. Burkert, *Lore and Science in Ancient Pythagoreanism* (Cambridge, Mass. 1972) 46: "What Aristotle presents as the philosophy of the Pythagoreans is truly pre-Socratic, unaffected by the achievements of Socratic-Platonic dialectic, and not to be measured by their standards."

[3] C. Huffman, *Philolaus of Croton, Pythagorean and Presocratic* (Cambridge 1993) esp. 28–34. Huffman admits that Aristotle might also have made use of "oral

1. Aristotle's Sources on the Pythagoreans

Aristotle mentions Pythagoras rarely (never in the works concerned with metaphysics, epistemology, and nature), and refers to Philolaus by name only once (*EE* 1225a33), in a context that has nothing to do

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reports" (32, 63), and even mentions that he might have made use of "other writing" (63), but he does not give serious weight to these other possibilities, especially since he (wrongly, see n. 19) rules out Archytas as a possible source. For discussion of individual points in Huffman's treatment, see nn. 5, 13, 14, 19, 42, 43, 50, 52, 109, 117, 133, and pp. 98–9.

[4] Philolaus **B1-B6**, quoted and translated in Section 4. Huffman considers these fragments authentic. See n. 12.

with metaphysical, physical, or mathematical speculation. When he gives his accounts of Pythagorean thought, he speaks instead of "the Pythagoreans" or "those called Pythagoreans."[5] If we knew nothing more about Philolaus, we would have absolutely no reason to suppose that Aristotle based his accounts on Philolaus's writings. On the other hand, we are told that Philolaus wrote one or more books[6] and that Plato owned a copy of at least one of them,[7] which if true may well place a copy of the book within Aristotle's reach. In addition, Philolaus is the first Pythagorean we know of to have left a written account of his philosophical views[8] and is the only Pythagorean we know to have done so prior to Archytas.[9] Further, Aristotle wrote at least one work[10] on the Pythagoreans and another work (containing three books) on Archytas.[11] These books would have been based at least partly on written Pythagorean sources. Moreover, a number of genuine fragments of Philolaus have survived that have a more or less close relation to Aristotle's reports of the philosophy of the Pythagoreans.[12]

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[5] The frequently made assertion that Aristotle commonly or often refers to the Pythagoreans as οἱ καλούμενοι Πυθαγορεῖοι (sometimes translated "the so-called Pythagoreans") is false, e.g. Burkert (above, n. 2) 30. This expression occurs only six times (*Cael.* 284b7, 293a20; *Metaph.* 985b23, 989b29; *Mete.* 342b30, 345a13) of which four (those from *De Caelo* and *Metaphysics*) are found in contexts where Aristotle refers to the Pythagoreans also as οἱ Πυθαγορεῖοι. By contrast, I count thirty-nine occurrences of οἱ Πυθαγορεῖοι in the following works: *Posterior Analytics*, *De Anima*, *De Caelo*, *Nicomachean Ethics*, *Magna Moralia*, *Metaphysics*, *Oeconomicus*, *Physics*, *Problems* and in the Fragments. Further, I see no reason to suppose that Aristotle means οἱ καλούμενοι Πυθαγορεῖοι in the sense of "the so-called Pythagoreans." The passages cited by Huffman (*Pol.* 1290b40 and 1291a1, *GA* 734a19, *De an.* 410b28) equally support the view that the phrase means "those known as Pythagoreans," "those I call Pythagoreans for my present purposes" or even "those who call themselves Pythagoreans." The occurrences of καλούμενοι in the *Politics* support this interpretation.

[6] One: D.L. 8.85; three: Iamblichus *VP* 199. Huffman (above, n. 3) 12–14 reasonably rejects the evidence for three books.

[7] Timon F 54 (= DK 44 A8), D.L. 8.85.

[8] D.L. 8.55 and other texts discussed by Huffman (above, n. 3) 15.

[9] See discussion in Huffman (above, n. 3) 8.

[10] D.L.'s catalogue of Aristotle works (D.L. 5.25) names both Πρὸς τοὺς Πυθαγορείους and Περὶ τῶν Πυθαγορείων. Burkert (above, n. 2) 29 n. 5 accepts both as genuine.

[11] D.L. 5.25.

[12] Huffman (above, n. 3) 34 takes Fragments 1–7, 13, and 17, and Testimonia 9, 16 (part), 17 (part), 18–21, and 27–28 to be genuine.

On the strength of these facts, Huffman has proposed that since Aristotle's work on Archytas will have been based on Archytas' writings, Philolaus's writings will be the only written source of Aristotle's references to "those called Pythagoreans" and "the Pythagoreans" in the summaries of Pythagorean thought in his extant works.[13]

If this is true, and in particular if the Pythagoreans whose views Aristotle records from time to time do not include Archytas, two questions immediately arise. First, why does Aristotle not speak of Philolaus, but of the Pythagoreans as a group? And second, how do we account for discrepancies between Aristotle's accounts and Philolaus's fragments? Regarding the first question, it is difficult to find a plausible explanation for Aristotle's failure to name Philolaus in the relevant passages.[14] The answer to the second question depends on the magnitude of the discrepancies. If they are small, we may simply say that Aristotle may have thought he was representing Philolaus accurately and he may not have noticed the discrepancies even though we do. Further, Aristotle's lack of sympathy for Pythagorean views and his evident failure to make sense of them may have resulted in distortions. But clearly, the greater the discrepancies prove to be, the harder it is to explain them away. In what follows, I will argue that some discrepancies are very great indeed.

On the other hand, if we suppose that Philolaus was not Aristotle's only source, there are several straightforward ways to explain Aristotle's preference for speaking of the Pythagoreans and his avoidance of mentioning any single Pythagorean, Philolaus in particular. First, his accounts of Pythagorean ideas may not be based on Philolaus at all, but on one or more other Pythagorean sources, written or oral, that are unknown to us. In this regard we must not neglect lost works on the Pythagoreans, such as the book of Aristoxenus, whose sources we are not in a position to name or evaluate. Second, his accounts may be based on Philolaus and on other Pythagorean sources as well. If there was more than one Pythagorean source at hand, Aristotle need not have expounded them separately. It would have been natural for him to give a single account stitched together from more than one source if he had thought that the differences were not major, and especially if he thought it unimportant for his particular purposes to make fine distinctions among the differing views.

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[13] Huffman (above, n. 3) loc. cit. Philolaus's book is "the only likely candidate" (32); "it is hard to say who Aristotle's sources would have been" if not Philolaus (58–9). But Huffman's argument, even if sound, will apply only to Aristotle's lost works on the Pythagoreans, not to what he says about Pythagorean doctrines in his extant treatises. I can find no reason to exclude the possibility that some of his remarks on the Pythagoreans, in particular his account of Eurytus, are based on Archytas (see n. 19).

[14] Even Huffman (above, n. 3) 34 seems to register unease on this point.

I will proceed by giving some evidence that Aristotle used more than one source (or a compendium of Pythagorean views, conceivably one of his own works that was based on more than one source) for his information on the Pythagoreans. In the subsequent treatment of Aristotelian passages on Pythagorean principles, I will point out some claims that do not fit well with what we know of Philolaus's views and which may be easier to account for by supposing that they stem from different sources. Later in the paper I will suggest (though it must remain only a suggestion) that Aristotle did not even use Philolaus as his principal source for Pythagorean doctrines, and that he may have regarded him as somewhat out of the mainstream. If this is so, it is no longer mysterious that Aristotle did not identify Philolaus in particular as the source of his information.

2. Some Pythagorean Doctrines

I begin with several testimonia that show that on some points the Pythagoreans had differing views.

> *De Caelo* 300a14–17: Τὸ δ' αὐτὸ συμβαίνει καὶ τοῖς ἐξ ἀριθμῶν συντιθεῖσι τὸν οὐρανόν· ἔνιοι γὰρ τὴν φύσιν ἐξ ἀριθμῶν συνιστᾶσιν, ὥσπερ τῶν Πυθαγορείων τινές.
>
> The same consequence follows from putting the heaven together out of numbers, for some people constitute all nature out of numbers, as some of the Pythagoreans do. (tr. based on the Revised Oxford Translation)[15]
>
> *Metaphysics* 1080b30–3: μοναδικοὺς δὲ τοὺς ἀριθμοὺς εἶναι πάντες τιθέασι, πλὴν τῶν Πυθαγορείων, ὅσοι τὸ ἓν στοιχεῖον καὶ ἀρχήν φασιν εἶναι τῶν ὄντων· ἐκεῖνοι δ' ἔχοντας μέγεθος.
>
> They all posit numbers to consist of abstract units except those of the Pythagoreans who declare "the one"[16] to be the element and principle of the

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[15] J. Barnes (ed.), *The Complete Works of Aristotle. The Revised Oxford Translation*, 2 vols. (Princeton 1984).

[16] I translate τὸ ἓν as "the one" (in "scare-quotes"). In most cases I take it as equivalent to the number one.

> things that are; those people suppose that numbers have magnitude. (tr. based on the Revised Oxford Translation)[17]

> *Meteorologica* 342b29–33: τῶν δ' Ἰταλικῶν τινες καλουμένων Πυθαγορείων ἕνα λέγουσιν αὐτὸν εἶναι τῶν πλανήτων ἀστέρων, ἀλλὰ διὰ πολλοῦ τε χρόνου τὴν φαντασίαν αὐτοῦ εἶναι καὶ τὴν ὑπερβολὴν ἐπὶ μικρόν.
> Some of the Italians called Pythagoreans say that it [sc. the comet] is one of the planets, but that it appears at great intervals of time and only rises a little above the horizon. (tr. based on the Revised Oxford Translation)

> *De Sensu* 445a16–17: ὃ δὲ λέγουσί τινες τῶν Πυθαγορείων, οὐκ ἔστιν εὔλογον· τρέφεσθαι γάρ φασιν ἔνια ζῷα ταῖς ὀσμαῖς.
> What some of the Pythagoreans say is unreasonable. They declare that some animals are nourished by odors alone. (my tr.)

I take it that Aristotle means one thing when he says that "the Pythagoreans" held a view and another when he says that "some Pythagoreans" held a view, and what he means in the latter case is that other Pythagoreans held different views on the same subject, whether or not he tells us what those other views are. In three instances he actually presents rival Pythagorean views.

> *De Anima* 404a16–19: ἔοικε δὲ καὶ τὸ παρὰ τῶν Πυθαγορείων λεγόμενον τὴν αὐτὴν ἔχειν διάνοιαν· ἔφασαν γάρ τινες αὐτῶν ψυχὴν εἶναι τὰ ἐν τῷ ἀέρι ξύσματα, οἱ δὲ τὸ ταῦτα κινοῦν.

> The doctrine of the Pythagoreans seems to have the same idea; some of them declared that the soul is the motes in the air, while others said that soul is what moves them. (tr. based on the Revised Oxford Translation)

> *Meteorologica* 345a13–18: τῶν μὲν οὖν καλουμένων Πυθαγορείων φασί τινες ὁδὸν εἶναι ταύτην οἱ μὲν τῶν ἐκπεσόντων τινὸς ἀστέρων, κατὰ τὴν λεγομένην ἐπὶ Φαέθοντος φθοράν, οἱ δὲ τὸν ἥλιον τοῦτον τὸν κύκλον φέρεσθαί ποτέ φασιν· οἷον οὖν διακεκαῦσθαι τὸν τόπον τοῦτον ἤ τι τοιοῦτον ἄλλο πεπονθέναι πάθος ὑπὸ τῆς φορᾶς αὐτῶν.

> Of those called Pythagoreans some say that this [viz. the Milky Way] is the path of one of the stars that fell from heaven during the alleged destruction at the time of Phaethon, while others say that the sun once moved in this circle; and so this region was scorched or met with some other affection of this kind, because of the motion of these bodies. (tr. based on the Revised Oxford Translation)

> *Metaphysics* 986a15–17, a22–6: φαίνονται δὴ καὶ οὗτοι τὸν ἀριθμὸν νομίζοντες ἀρχὴν εἶναι καὶ ὡς ὕλην τοῖς οὖσι καὶ ὡς πάθη τε καὶ ἕξεις, … ἕτεροι δὲ τῶν αὐτῶν τούτων τὰς ἀρχὰς δέκα λέγουσιν εἶναι τὰς κατὰ συστοι-

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[17] This translation differs considerably from the Revised Oxford Translation (which, following Ross, fails to translate 1080b32). I take ὅσοι as identifying a group of Pythagoreans rather than explicating what all the Pythagoreans did.

> χίαν λεγομένας, πέρας [καὶ] ἄπειρον, περιττὸν [καὶ] ἄρτιον, ἓν [καὶ] πλῆθος, δεξιὸν [καὶ] ἀριστερόν, ἄρρεν [καὶ] θῆλυ, ἠρεμοῦν [καὶ] κινούμενον, εὐθὺ [καὶ] καμπύλον, φῶς [καὶ] σκότος, ἀγαθὸν [καὶ] κακόν, τετράγωνον [καὶ] ἑτερόμηκες.
>
> Evidently, then, these thinkers consider that number is the principle both as matter for the things that are and as their attributes and states…. Others of this same group say there are ten principles, which they arrange in parallel columns – limit and unlimited, odd and even, one and plurality, right and left, male and female, resting and moving, straight and curved, light and darkness, good and bad, square and oblong. (tr. based on Revised Oxford Translation)

Did Aristotle derive this information from a single source? If he did, it would almost have to be a compendium of their views rather than a single original text such as that of Philolaus, which seems (like other presocratic texts, as far as we can tell) to have set out its author's theory without expounding other people's contrasting views.

In one case Aristotle refers a particular doctrine to a Pythagorean other than Philolaus.

> *Metaphysics* 1092b10–12: καὶ ὡς Εὔρυτος ἔταττε τίς ἀριθμὸς τίνος, οἷον ὁδὶ μὲν ἀνθρώπου ὁδὶ δὲ ἵππου, ὥσπερ οἱ τοὺς ἀριθμοὺς ἄγοντες εἰς τὰ σχήματα τρίγωνον καὶ τετράγωνον οὕτως ἀφομοιῶν ταῖς ψήφοις τὰς μορφὰς τῶν φυτῶν.
>
> This is how Eurytus decided what was the number of what—e. g., this is the number of man, that is the number of horse – by imitating the figures of living things with pebbles, like those who bring numbers into the forms of triangle and square. (tr. based on the Revised Oxford Translation)

Since Eurytus is said to have been the student of Philolaus,[18] it seems unlikely that Aristotle's source on this point would have been Philolaus's book. In fact, Theophrastus attributes this information to Archytas.[19]

I take it that these passages prove beyond doubt that Aristotle knew of cases where different Pythagoreans held different views, and I take it as a consequence that his information on at least these areas of Pythagorean philosophy did not come from Philolaus or from any other single Pythagorean source.[20] This result establishes the possibility, if not the strong likelihood, that Aristotle was indebted to a plurality of sources in other cases where he reports disagreeing Pythagorean views, even where he does not go out of his way to say that a particular view was held by "some Pythagoreans." In fact, we will shortly see that his accounts of Pythagorean views on the nature of first principles and on the relations between numbers and things contain a good deal of disagreement.

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[18] Iamblichus, *VP* 139, 148; references from Huffman (above, n. 3) 4.

[19] Theophrastus, *Met.* 6a19–22. Theophrastus does not say that Aristotle used Archytas as his source, but since Theophrastus uses the same examples (man, horse) as Aristotle, it seems almost certain that Aristotle directly or indirectly uses Archytas here, something not remarked on by Huffman, and an important counterexample to his claim that Philolaus's book was the only written source that Aristotle used. See n. 13.

3. Aristotle's Accounts of Pythagorean Principles: A First Look

The following is a catalogue of the chief claims about principles and about the relation between numbers and things that Aristotle attributes to the Pythagoreans.

N1 The things that are, are composed of numbers.

> *De Caelo* 300a14–17 (quoted in Greek above, p. 57): The same consequence follows from putting the heaven together out of numbers, for some people constitute all nature out of numbers, as some of the Pythagoreans do. (tr. based on the Revised Oxford Translation)
>
> *Metaphysics* 990a21–2: τὸν ἀριθμὸν τοῦτον ἐξ οὗ συνέστηκεν ὁ κόσμος.
>
> This number out of which the cosmos is constituted. (tr. Revised Oxford Translation)
>
> *Metaphysics* 1080b17–19: ἐκ τούτου τὰς αἰσθητὰς οὐσίας συνεστάναι φασίν· τὸν γὰρ ὅλον οὐρανὸν κατασκευάζουσιν ἐξ ἀριθμῶν.
>
> They say that sensible substances are constituted out of it [viz. number]. For they fabricate the entire heaven out of numbers. (tr. based on the Revised Oxford Translation)
>
> *Metaphysics* 1083b11–12 (**C3.1**[21]): τὸ δὲ τὰ σώματα ἐξ ἀριθμῶν εἶναι συγκείμενα.
>
> Bodies are composed of numbers. (tr. based on Revised Oxford Translation)
>
> *Metaphysics* 1083b18–19 (**C3.3**): τὰ γοῦν θεωρήματα προσάπτουσι τοῖς σώμασιν ὡς ἐξ ἐκείνων ὄντων τῶν ἀριθμῶν.

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[20] By saying this, I do not mean to exclude the possibility that he used a single work, such as a compendium of Pythagorean views, that was itself based on more than one source.

[21] This designation refers to the translation and discussion of the passages in question below, in Section 7. The translation given in these cases is my own translation.

In fact they apply their propositions to bodies supposing that they consisted of those numbers. (tr. based on Revised Oxford Translation)

Metaphysics 1090a22–3 (**C4.4**): ἐποίησαν … ἐξ ἀριμθμῶν τὰ ὄντα.

They made the things that are, out of numbers. (my tr.)

Metaphysics 1090a32 (**C4.6**): ποιεῖν ἐξ ἀριθμῶν τὰ φυσικὰ σώματα.

They make the natural bodies out of numbers. (tr. based on Revised Oxford Translation)

N2 The things that are (or "things") are numbers.

Metaphysics 986a21 (**C1.13**): ἀριθμοὺς δέ, καθάπερ εἴρηται, τὸν ὅλον οὐρανόν.

The entire heaven, as has been said, is numbers. (tr. based on Revised Oxford Translation)

Metaphysics 987b27–8: οἱ δ' ἀριθμοὺς εἶναί φασιν αὐτὰ τὰ πράγματα.

They say that the things themselves are numbers. (tr. Revised Oxford Translation)

Metaphysics 1090a22–3 (**C4.2**): εἶναι μὲν ἀριθμοὺς ἐποίησαν τὰ ὄντα.

They made the things that are, numbers. (my tr.)

N3 The things that are are number.[22]

Metaphysics 986a2–3 (**C1.9**): τὸν ὅλον οὐρανὸν ἁρμονίαν εἶναι καὶ ἀριθμόν.

[They supposed] the entire heaven to be a musical scale and a number. (tr. based on Revised Oxford Translation)

Metaphysics 1083b17 (**C3.2**): ἐκεῖνοι δὲ τὸν ἀριθμὸν τὰ ὄντα λέγουσιν.

They say that the things that are, are number. (my translation)

N4 Things resemble numbers; the things that are, are by imitation of numbers.

Metaphysics 985b27–31 (**C1.3-C1.4**): ἐν δὲ τούτοις ἐδόκουν θεωρεῖν ὁμοιώματα πολλὰ τοῖς οὖσι καὶ γιγνομένοις, μᾶλλον ἢ ἐν πυρὶ καὶ γῇ καὶ ὕδατι, ὅτι τὸ μὲν τοιονδὶ τῶν ἀριθμῶν πάθος δικαιοσύνη τὸ δὲ τοιονδὶ ψυχή τε καὶ νοῦς ἕτερον δὲ καιρὸς καὶ τῶν ἄλλων ὡς εἰπεῖν ἕκαστον ὁμοίως.

In these (viz. numbers) they thought they observed many likenesses to the things that are and that come to be … such and such an attribute of numbers being justice, another being soul and mind, another being "the right moment,"[23] and similarly for virtually all other things. (my tr.)

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[22] I suggest in n. 75 that there is no difference between N2 and N3.

[23] I prefer this translation of καιρός to "opportunity" or "due season."

Metaphysics 985b31–2 (**C1.5**): τῶν ἁρμονιῶν ἐν ἀριθμοῖς ὁρῶντες τὰ πάθη καὶ τοὺς λόγους.

They saw the attributes and the ratios of the harmonic intervals in numbers. (tr. based on Revised Oxford Translation)

Metaphysics 985b32–3 (**C1.6**): ἃ μὲν ἄλλα τοῖς ἀριθμοῖς ἐφαίνοντο τὴν φύσιν ἀφωμοιῶσθαι πᾶσαν.

All other things seemed to be made in the likeness of numbers in their entire nature. (tr. based on Revised Oxford Translation)

Metaphysics 987b11–12: οἱ μὲν γὰρ Πυθαγόρειοι μιμήσει τὰ ὄντα φασὶν εἶναι τῶν ἀριθμῶν.

For the Pythagoreans say that the things that are, are by imitation of numbers. (tr. based on Revised Oxford Translation)

Metaphysics 1090a20–2 (**C4.1**): οἱ δὲ Πυθαγόρειοι διὰ τὸ ὁρᾶν πολλὰ τῶν ἀριθμῶν πάθη ὑπάρχοντα τοῖς αἰσθητοῖς σώμασιν.

But the Pythagoreans, because they saw many attributes of numbers belonging to sensible bodies … (tr. Revised Oxford Translation)

Metaphysics 1090a24–5 (**C4.5**): τὰ πάθη τὰ τῶν ἀριθμῶν ἐν ἁρμονίᾳ ὑπάρχει καὶ ἐν τῷ οὐρανῷ καὶ ἐν πολλοῖς ἄλλοις.

The attributes of numbers are present in harmonic intervals and in the heavens and in many other things. (tr. Revised Oxford Translation)

N5 The principles (ἀρχαί) of mathematical entities[24] are the principles of all the things that are.[25]

Metaphysics 985b25–6 (**C1.1**): τὰς τούτων ἀρχὰς τῶν ὄντων ἀρχὰς ᾠήθησαν εἶναι πάντων.

They believed that the principles of these things are the principles of all the things that are. (my tr.)

N6 The elements (στοιχεῖα) of numbers are the elements of all things.

Metaphysics 986a1–2 (**C1.8**): τὰ τῶν ἀριθμῶν στοιχεῖα τῶν ὄντων στοιχεῖα πάντων ὑπέλαβον εἶναι.

They supposed the elements of numbers to be the elements of all the things that are. (tr. based on Revised Oxford Translation)

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[24] For this interpretation, see nn. 54, 55.

[25] The sequel shows that Aristotle interprets these principles to be the principles of number. See discussion of **C1.8** below, p. 84.

N7 Number is a principle (ἀρχή) both as matter and as attributes and states.

> *Metaphysics* 986a15–17 (**C1.11**): φαίνονται δὴ καὶ οὗτοι τὸν ἀριθμὸν νομίζοντες ἀρχὴν εἶναι καὶ ὡς ὕλην τοῖς οὖσι καὶ ὡς πάθη τε καὶ ἕξεις.
>
> Evidently, then, these people too consider that number is the principle both as matter for the things that are and as their attributes and states. (tr. based on Revised Oxford Translation)

N8 The principles are two: the limited and the unlimited …; the unlimited itself and "the one" itself are the οὐσία of the things of which they are predicated, and this is why the οὐσία of all things is number.

> *Metaphysics* 987a13–19: (**C2.1-C2.4**): οἱ δὲ Πυθαγόρειοι δύο μὲν τὰς ἀρχὰς κατὰ τὸν αὐτὸν εἰρήκασι τρόπον, τοσοῦτον δὲ προσεπέθεσαν ὃ καὶ ἴδιόν ἐστιν αὐτῶν, ὅτι τὸ πεπερασμένον καὶ τὸ ἄπειρον [καὶ τὸ ἓν] οὐχ ἑτέρας τινὰς ᾠήθησαν εἶναι φύσεις, οἷον πῦρ ἢ γῆν ἤ τι τοιοῦτον ἕτερον, ἀλλ' αὐτὸ τὸ ἄπειρον καὶ αὐτὸ τὸ ἓν οὐσίαν εἶναι τούτων ὧν κατηγοροῦνται, διὸ καὶ ἀριθμὸν εἶναι τὴν οὐσίαν πάντων.
>
> The Pythagoreans similarly posited two principles but they added something peculiar to themselves, not that the limited and the unlimited are distinct natures like fire or earth or anything else of that kind, but that the unlimited itself and "the one" itself are the οὐσία of the things of which they are predicated. This is why they call number the οὐσία of all things. (tr. based on Revised Oxford Translation)

N9 The οὐσία of something is the first thing it happens to belong to (the number two is the essence of double).

> *Metaphysics* 987a22–5 (**C2.6**): καὶ ᾧ πρώτῳ ὑπάρξειεν ὁ λεχθεὶς ὅρος, τοῦτ' εἶναι τὴν οὐσίαν τοῦ πράγματος ἐνόμιζον, ὥσπερ εἴ τις οἴοιτο ταὐτὸν εἶναι διπλάσιον καὶ τὴν δυάδα διότι πρῶτον ὑπάρχει τοῖς δυσὶ τὸ διπλάσιον.
>
> They thought that the first subject of which a given term is predicable is the οὐσία of the thing, as if one supposed that double and the number two were the same because the number two is the first thing double applies to. (tr. based on Revised Oxford Translation)

N10 "The one" is οὐσία; numbers are causes of the οὐσία of the other things.

> *Metaphysics* 987b22–5: τὸ μέντοι γε ἓν οὐσίαν εἶναι, καὶ μὴ ἕτερόν γέ τι ὂν λέγεσθαι ἕν, παραπλησίως τοῖς Πυθαγορείοις ἔλεγε, καὶ τὸ τοὺς ἀριθμοὺς αἰτίους εἶναι τοῖς ἄλλοις τῆς οὐσίας ὡσαύτως ἐκείνοις.
>
> He [Plato] agreed with the Pythagoreans in saying that "the one" is substance (οὐσία) and not a predicate of something else; and also in saying that the numbers are the causes of the substance (οὐσία) of all other things. (tr. based on Revised Oxford Translation)

N11 The elements (στοιχεῖα) of number are the even (which is unlimited) and the odd (which is limited); “the one” is “from” the even and the odd, and number is “from” “the one.”

> *Metaphysics* 986a17–21 (**C1.12**) τοῦ δὲ ἀριθμοῦ στοιχεῖα τό τε ἄρτιον καὶ τὸ περιττόν, τούτων δὲ τὸ μὲν πεπερασμένον τὸ δὲ ἄπειρον, τὸ δ’ ἓν ἐξ ἀμφοτέρων εἶναι τούτων (καὶ γὰρ ἄρτιον εἶναι καὶ περιττόν), τὸν δ’ ἀριθμὸν ἐκ τοῦ ἑνός.
>
> The elements of number are the even and the odd, and of these the former is unlimited, and the latter limited. And “the one” is “from” both of these (for it is both even and odd) and number is “from” “the one.” (tr. based on Revised Oxford Translation)

N12 When “the one” had been constituted, the nearest part of the unlimited immediately began to be drawn in and limited by the limit.

> *Metaphysics* 1091a15–18: ὡς τοῦ ἑνὸς συσταθέντος, εἴτ’ ἐξ ἐπιπέδων εἴτ’ ἐκ χροιᾶς εἴτ’ ἐκ σπέρματος εἴτ’ ἐξ ὧν ἀποροῦσιν εἰπεῖν, εὐθὺς τὸ ἔγγιστα τοῦ ἀπείρου ὅτι εἵλκετο καὶ ἐπεραίνετο ὑπὸ τοῦ πέρατος.
>
> When “the one” had been constituted (whether from planes or from a surface or from seed or from things which they are at a loss to say), the nearest parts of the unlimited at once began to be drawn in and limited by the limit. (tr. based on Revised Oxford Translation)

N13 The συστοιχία (parallel columns)

> *Metaphysics* 986a22–6 (quoted in Greek above, pp. 58–9): Others of this same group say there are ten principles, which they arrange in parallel columns—limit and unlimited, odd and even, one and plurality, right and left, male and female, resting and moving, straight and curved, light and darkness, good and bad, square and oblong. (tr. based on Revised Oxford Translation)

N13 contrasts with the rest, and is marked as being the view of “others of this same group,” that is, other Pythagoreans. The remaining texts are concerned with numbers as principles of other things and with the principles of numbers. They are an untidy collection. Their untidiness lends itself to two ways of treating them, either as reflections of a single coherent ontology or as derived from different sources that represent different and incompatible views.

The first approach points towards a system of at least three tiers,[26] as follows.

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[26] Burkert describes a system along these lines at Burkert (above, n. 2) 32 ff. I present a five-tier system below, p. 101.

Tier 1: the limited (or limit) and the unlimited, or the even and the odd
Tier 2: numbers
Tier 3: "all things" (that is, all things not included in Tiers 1 and 2)

No one of the claims **N1**-**N12** sets out the entire system, but each of them can be seen as revealing a part of it. The limited and the unlimited (or the even and the odd) are the principles of numbers (some testimonia favor the idea that "the one" is prior to and in some way a principle of the other numbers[27]), which are in turn the principles of "all things"; in a sense the limited and the unlimited are the principles of "all things" too. The notion of principle involved is not spelled out or analyzed. It may be metaphysical (in the sense of an essentially basic entity), genetic (in the sense that the principles generate the things whose principles they are), temporal (in the sense that the principles exist before the things whose principles they are), material (in the sense that the things are made up out of their principles), or a combination of these.

The overall picture that this approach produces is as follows. The principles of numbers are the limited and the unlimited, or alternately the even (which is unlimited) and the odd (which is limited). These principles first generate (or compose or are the ingredients in the essence of) "the one." "The one" generates (or composes, etc.) the (other) numbers. Numbers are the causes of the οὐσία of the remaining things, which are generated by (or composed of, etc.) numbers, or are numbers, or are by imitation of numbers. The variety of ways in which Aristotle expresses the relation between numbers and things will reflect differences in his sources and also the difficulty he had in comprehending these ideas and his fundamental lack of sympathy with them.

Where the first approach smoothes over disagreement among the passages, the second approach emphasizes their discrepancies. Thus, it is one thing to say (**N2**) that things are numbers, and quite another to say (**N1**) that they are ἐκ numbers, whether that means that they are constituted out of numbers as a statue is constituted out of bronze, or that numbers generate them or something else. It is still another thing to say (**N6**, cf. **N5**) that the principles or elements of numbers are the principles or elements of all things, which is compatible with "all things" being on the same level (whether ontological, causal, genetic or otherwise) as numbers and not dependent on them at all. And yet another thing to say (**N4**) that things are by imitation of numbers. We may also doubt that **N8**'s assertion that the οὐσία of all things is number and **N10**'s claim that numbers are causes of the οὐσία of the other things are consistent. It is not clear how to unify **N11**'s claim that "the one" is ἐκ the even and the odd with **N12**'s assertion that the Pythagoreans are at a loss to say how "the one" was constituted. Or how "the one" is related to the unlimited in **N8**: is the unlimited one of the principles of "the one," or is it identical with "the one"? Other inconsistencies are easy to find in these claims as well. A straightforward way to account for them would be to suppose that Aristotle is basing his accounts on several sources which he considered to represent Pythagorean thought and that they were broadly similar, yet importantly different.

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[27] *Metaph.* 987a18 with discussion below, p. 100.

These two approaches lead to two different assessments of Aristotle's treatment of his sources. On the first, the sources state their views imprecisely and/or Aristotle does a poor job of understanding what they say; on the second, the sources may well state their (contrasting) views precisely and Aristotle may succeed in understanding their claims or at least reporting them accurately (even though he finds it impossible to make philosophical sense of them). The two approaches also lead to two different assessments of early Pythagorean views on principles. The first supposes that there is a Pythagorean orthodoxy behind Aristotle's various expressions (except for the outlier **N13**). A variation on this assessment is that Aristotle is using only one source (perhaps Philolaus) which is self-consistent. The second approach makes no such supposition. The different and inconsistent claims that Aristotle attributes to the Pythagoreans are in fact more or less accurate expressions of different Pythagorean beliefs.

This second approach is certainly worth considering and it is also worthwhile to consider Philolaus in connection with it. If we do not suppose from the start that Philolaus was Aristotle's only source, or that Aristotle's source or sources, whoever or whatever they may have been, need have told a coherent and consistent story, we are free to look for variations, seeing Pythagoreanism as a movement rather than as a monolithic theory (which would have been unique for its time; we find no uniform set of doctrines among either the Milesians or the Eleatics[28]) and even to evaluate Philolaus's position within the movement. If his doctrines prove to be somewhat remote from the doctrines that Aristotle describes, the explanation may be not that Aristotle was inaccurate, but that he did not regard Philolaus as particularly representative of the movement. On the other hand, on due consideration it may seem best to stick to some version of the traditional view, that Aristotle meant in the main to attribute a single theory to the Pythagoreans, one that he found inconsistent and in ways obviously false. And it may be best to decide that this single theory was that of Philolaus.

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[28] I name the two obvious candidates in early Greek philosophy for groups of thinkers closely associated with one another. In fact, it is not infrequent even now to read of "the Milesian school" and "the Eleatic school" of philosophy. But the differences in the views of Thales, Anaximander, and Anaximenes are

4. Philolaus's Fragments on Principles

The main texts for Philolaus's views on principles are the following.[29]

> **B1** ἁ φύσις δ᾽ ἐν τῷ κόσμῳ ἁρμόχθη ἐξ ἀπείρων τε καὶ περαινόντων, καὶ ὅλος <ὁ> κόσμος καὶ τὰ ἐν αὐτῷ πάντα.
>
> Nature in the cosmos was joined from both unlimiteds and limiters, and the entire cosmos and all the things in it.
>
> **B2** ἀνάγκα τὰ ἐόντα εἶμεν πάντα ἢ περαίνοντα ἢ ἄπειρα ἢ περαίνοντά τε καὶ ἄπειρα· ἄπειρα δὲ μόνον οὔκ ἀεί. ἐπεὶ τοίνυν φαίνεται οὔτ᾽ ἐκ περαινόντων πάντων ἐόντα οὔτ᾽ ἐξ ἀπείρων πάντων, δῆλον τἆρα ὅτι ἐκ περαινόντων τε καὶ ἀπείρων ὅ τε κόσμος καὶ τὰ ἐν αὐτῷ συναρμόχθη. δηλοῖ δὲ καὶ τὰ ἐν τοῖς ἔργοις. τὰ μὲν γὰρ αὐτῶν ἐκ περαινόντων περαίνοντι, τὰ δ᾽ ἐκ περαινόντων τε καὶ ἀπείρων περαίνοντί τε καὶ οὐ περαίνοντι, τὰ δ᾽ ἐξ ἀπείρων ἄπειρα φανέονται.
>
> It is necessary that the things that are be all either limiters or unlimiteds or both limiters and unlimiteds; but not in all cases only unlimiteds. Now since it is evident that they are neither from things that are all limiters nor from things that are all unlimiteds, it is therefore clear that both the cosmos and the things in it were joined together from both limiters and unlimiteds. The behavior of these things in turn makes it clear. For those of them that are from limiters limit, those that are from both limiters and unlimiteds both limit and do not limit, and those that are from unlimiteds will evidently be unlimited.
>
> **B3** ἀρχὰν οὐδὲ τὸ γνωσούμενον ἐσσεῖται πάντων ἀπείρων ἐόντων.

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well known: whatever the Milesians had in common, it was not that they adhered to any specific doctrines. And the uniformity in the views of the Eleatics is less than perfect. Notably, Aristotle is as impressed by the differences in the views of Parmenides and Melissus as much as he is by their similarities (Aristotle *Phys.* 184b16, 185b17–18; *Metaph.* 986b18–21).

[29] I follow Huffman's text, but use my own translations, which differ from Huffman's in some respects.

There will not be anything that is going to know at all, if all things are unlimited.

B4 καὶ πάντα γα μὰν τὰ γιγνωσκόμενα ἀριθμὸν ἔχοντι· οὐ γὰρ ὁτιῶν <οἷόν> τε οὐδὲν οὔτε νοηθῆμεν οὔτε γνωσθῆμεν ἄνευ τούτω.

And in fact all the things that are known have number. For it is not possible for anything at all either to be comprehended or known without this.

B5 ὅ γα μὰν ἀριθμὸς ἔχει δύο μὲν ἴδια εἴδη, περισσὸν καὶ ἄρτιον, τρίτον δὲ ἀπ᾽ ἀμφοτέρων μιχθέντων ἀρτιοπέριττον· ἑκατέρω δὲ τῶ εἴδεος πολλαὶ μορφαί, ἃς ἕκαστον αὐτὸ σημαίνει.

In fact, number has two proper kinds, even and odd, and a third kind, even-odd, from both mixed together.[30] Of each of the two kinds there are many forms, of which each thing itself gives signs.

B6 περὶ δὲ φύσιος καὶ ἁρμονίας ὧδε ἔχει· ἁ μὲν ἐστὼ τῶν πραγμάτων ἀίδιος ἔσσα καὶ αὐτὰ μὰν ἁ φύσις θείαν τε καὶ οὐκ ἀνθρωπίνην ἐνδέχεται γνῶσιν πλὰν γα ἢ ὅτι οὐχ οἷόν τ᾽ ἦν οὐθενὶ τῶν ἐόντων καὶ γιγνωσκομένων ὑφ᾽ ἁμῶν γενῆσθαι μὴ ὑπαρχούσας τᾶς ἐστοῦς τῶν πραγμάτων, ἐξ ὧν συνέστα ὁ κόσμος, καὶ τῶν περαινόντων καὶ τῶν ἀπείρων. ἐπεὶ δὲ ταὶ ἀρχαὶ ὑπᾶρχον οὐχ ὁμοῖαι οὐδ᾽ ὁμόφυλοι ἔσσαι, ἤδη ἀδύνατον ἦς κα αὐταῖς κοσμηθῆναι, εἰ μὴ ἁρμονία ἐπεγένετο ᾧτινιῶν ἂν τρόπῳ ἐγένετο. τὰ μὲν ὦν ὁμοῖα καὶ ὁμόφυλα ἁρμονίας οὐδὲν ἐπεδέοντο, τὰ δὲ ἀνόμοια μηδὲ ὁμόφυλα μηδὲ † ἰσοταχῆ ἀνάγκα τὰ τοιαῦτα ἁρμονίᾳ συγκεκλεῖσθαι, εἰ μέλλοντι ἐν κόσμῳ κατέχεσθαι.

Concerning nature and ἁρμονία this is how it is: the being (ἐστώ) of things, which is eternal – that is, in fact, their very nature – admits knowledge that is divine and not human, except that it was impossible for any of the things that are and are known by us, to have come to be if there did not exist the being (ἐστώ) of the things from which the cosmos is constituted—both the limiters and the unlimiteds. But since the principles are not similar or of the same kind, it would be completely impossible for them to be brought into order if ἁρμονία had not come upon them in whatever way it did. Now things that are similar and of the same kind have no need of ἁρμονία to boot, but those that are dissimilar and not of the same kind or of the same speed[†] must be connected together in ἁρμονίαι if they are going to be kept in an orderly arrangement.

B7 τὸ πρᾶτον ἁρμοσθέν, τὸ ἓν ἐν τῷ μέσῳ τᾶς σφαίρας, ἑστία καλεῖται.

The first thing that was joined, the one in the middle of the sphere, is called the hearth.

B17 ὁ κόσμος εἷς ἐστιν, ἤρξατο δὲ γίγνεσθαι ἄχρι τοῦ μέσου καὶ ἀπὸ τοῦ μέσου εἰς τὸ ἄνω διὰ τῶν αὐτῶν τοῖς κάτω, <καὶ> ἔστι τὰ τὰ ἄνω τοῦ μέσου ὑπεναντίως κείμενα τοῖς κάτω. τοῖς γὰρ κάτω τὸ κατωτάτω μέρος

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[30] I follow J. Barnes, *The Presocratic Philosophers*^{2} (London 1982) 632 n. 31, in deleting this phrase.

> ἐστὶν ὥσπερ τὸ ἀνωτάτω καὶ τὰ ἄλλα ὡσαύτως. πρὸς γὰρ τὸ μέσον κατὰ ταὐτά ἐστιν ἑκάτερα, ὅσα μὴ μετενήνεκται.
>
> The cosmos is one. It began to come to be right up at the middle, and from the middle <it came to be> in an upward direction in the same way as it did in a downward direction, and the things above the middle are symmetrical with those below. For in the lower <regions> the lowest part is like the highest part <in the upper regions>, and similarly for the rest. For both <the higher and the lower> have the same relationship to the middle, unless they have been moved to another location.

5. Similarities and Differences between Philolaus and Aristotle

Philolaus's account differs from Aristotle's in a number of ways, of which I will mention those that seem to me potentially significant.

First, Philolaus speaks of περαίνοντα and ἄπειρα, limiting things and unlimited things, or alternatively things that are limiting (or things that limit) and things without limit, or limiters and unlimiteds (**B1**, **B2**, **B3**, **B6**). These are the things out of which the cosmos is constituted or put together (συνέστα) (**B6**). Philolaus's account differs from the Aristotelian material first in using plural active forms ("limiters" and "unlimiteds") as opposed to the singular and frequently the passive in Aristotle's reports ("the limited" or "limit," and "the unlimited") (**N8**, **N11**, **N12**, **N13**), which may point to a tendency to conceive of those entities in more concrete terms than Aristotle's account suggests: things that limit as opposed to the more abstract expression "limit"; things that are unlimited as opposed to "the unlimited."[31]

Second, Philolaus holds that the cosmos is constituted or put together out of the limiters and unlimiteds (**B1**, **B6**), as if they are physical constituents, whereas Aristotle calls the one (seemingly identical with limit) and the unlimited the οὐσία of the things of which they are predicated (**N8**).

Third, Philolaus places great weight on *harmonia*, while Aristotle's accounts make no mention of *harmonia* except in the sense of musical *harmonia*, an attunement of a lyre according to fixed harmonic intervals, corresponding roughly to our musical scale.[32] In particular this holds for the statement that they supposed the entire heaven to be a *harmonia* and a number.[33] In Philolaus it is a much broader notion. Limiteds and unlimiteds are joined together (the verbs he uses are ἁρμόττειν, συναρμόττειν, which are related to the noun *harmonia*) by *harmonia*, and *harmonia* must "come upon" (ἐπιγίγνεσθαι) them (**B6**). Philolaus does use *harmonia* in the sense of musical *harmonia* as well, prominently in fragment B6a (not translated here), but the other fragments cited give it a wider sense and a more central role in Philolaus's metaphysics and cosmology. In Philolaus's view, the opposing natures of limiters and unlimiteds constitute an obstacle to their uniting to form the cosmos and the things in the cosmos. A third ingredient, *harmonia*, is needed to effect this union. On the other hand, Aristotle's account gives no hint that the way in which things are constituted out of limit and the unlimited was problematic or that *harmonia* has any role in this regard.

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[31] See Huffman's discussion (above, n. 3) 39–40.

[32] *Metaph.* 985b31 (= **C1.5**), 986a3 (= **C1.9**), 1087b35, 1090a24 (= **C4.5**), 1093a14.

The fourth and most striking discrepancy between Philolaus's account and Aristotle's concerns the role of numbers. In Aristotle numbers are very prominent. They are generated from or otherwise based on the even and odd, which are associated somehow with the unlimited and the limited (**N11**), and "things" are then in turn dependent on numbers. According to his most frequent formulations, they are constituted out of numbers (**N1**) or they *are* numbers (**N2**). Indeed he gives the role of numbers in the cosmos more prominence than any other feature of Pythagorean thought. By contrast, the fragments of Philolaus give the lead roles to limiters and unlimiteds, not to numbers. It is not clear whether or how numbers are derived from these basic entities. Numbers are important, to be sure. Each thing "gives signs" of numbers (**B5**), and all the things that can be known "have" number (**B4**). But what the cosmos and all its inhabitants are constituted out of are limiters and unlimiteds, not numbers (**B1**, **B2**). I will have more to say on this subject just below.

Now that these general points have been made, it is time to consider the relations between Aristotle's testimonia and the fragments of Philolaus in greater detail. To begin with, nothing in the extant fragments of Philolaus has any direct connection with **N1**, **N2**, **N3**, **N4**, **N7**, **N9**, **N10**, or **N13.** According to Philolaus the principles are limiters and unlimiteds, not numbers (**B1**, contrast **N7**). Things are joined together out of *these* principles, not from numbers (**B1**, **B2**; contrast **N1**). Further, Philolaus does not say that all things "are" his principles (especially **B2**, contrast **N2**, **N3**) or that they "are" by imitating the principles or that they resemble them (contrast **N4**), or that the being[34] of a thing is the first thing it happens to belong to (**B6**, contrast **N9**) or that "the one" and the other numbers are the ἐστώ of anything at all (**B6**, contrast **N10**). Finally, the doctrine of the parallel columns (**N13**) is remote from anything Philolaus says.[35]

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[33] With *Metaph.* 986a3, cf. *Cael* 2.9.

Philolaus's belief that all the things that are known have number (B4) is importantly different from **N1**, **N2**, and **N3**, first because **B4** concerns "all the things that are known," not "all things" in general, and second because **B4** says that they "have" number, not that they "are" or "are constituted out of" number or numbers. Nor does Philolaus talk of things imitating numbers or having likenesses to numbers (**N4**). **B4** gives the impression that "having" number is a necessary condition for a thing to be known, but not a necessary and sufficient condition for a thing to be, and for this reason Huffman sees the role of number as epistemological rather than ontological.[36] However, this may be too strong; the one need not exclude the other. **B4** makes it plausible that Philolaus supposed that a thing that is known is known *because* it has number and that it is known because of the number that it has. Further, it is possible that he held that it is a thing's possession of number (whatever that may mean and however the number it possesses may be related to the limiters and unlimiteds that constitute that thing) that constitutes the thing as knowable. If this is correct, it leaves open the possibility that number has an important ontological role alongside its epistemological role.[37] But even so, Aristotle's reports on the place of number in Pythagorean thought remain remote from what we learn from **B4.**

Philolaus offers an ontology with at least two[38] tiers: on the top tier are the limiters and the unlimited, which are first principles, while the bottom tier is constituted of what Philolaus describes as "nature in the cosmos" and "the entire cosmos and all the things in it" (**B1**). The essential question here is where do numbers fit in—are they on the top tier, the bottom tier, somewhere in between, or are they not included in the entities **B1** refers to? Unfortunately the fragments provide insufficient help. The terminology of limiters and unlimiteds is so abstract that it is not at all certain what it refers to,[39] and it is quite unclear whether "the entire cosmos and all the things in it" includes numbers in addition to (what we regard as) more concrete objects.[40]

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[34] Philolaus's word is ἐστώ rather than οὐσία. See discussion of **N8** below, pp. 72–6.

[35] For this discrepancy, see Huffman (above, n. 3) 47 n. 1.

[36] See Huffman (above, n. 3) 58, also 39, and his discussion of what "having a number" means, on 64–73. My own opinion is that Philolaus's ultimate unlimited principles (whether there are one or many), which certainly do exist, do not "have number."

[37] I cannot go further into this important topic in the present paper. I hope to explore it further in the future.

[38] A case can be made for an indefinitely large number of tiers, but I do not have the space to discuss this issue at present.

Further on this point, **N12** is usually taken to describe the generation of numbers by the action of limit on the unlimited. If this is the correct interpretation, it has no connection with Philolaus's surviving fragments (although this does not prove that he did not hold the view). In any case, in **N12** "the one" and the other generated entities are not principles, so that numbers cannot belong to the top tier. However, there are some difficulties. In the first place, as **N12** says, how "the one" is constituted was not made clear. Next, the nature of the relation between "the one" and the subsequently generated entities is obscure. More radically, it is not even certain that **N12** describes the generation of numbers at all. Huffman has proposed an interpretation according to which **N12** has nothing to do with numbers; "the one" refers to the central fire, and the passage is an account of the first stage of a cosmogony.[41] And most importantly, to assume that there is any connection between **N12** and Philolaus would beg the question, since this is the very subject under investigation.

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[39] Huffman (above, n. 3) 40–1.

[40] An interpretation which I hope to develop in the near future is that for Philolaus the number of a thing is (in a suitably general sense) the measure of the magnitudes of the entities (limiters and unlimiteds) that constitute an entity. If this is correct, then for Philolaus things are not constituted out of numbers or identical with numbers and do not resemble numbers, but it is possible that he held that in some sense the "being" of a thing is or involves its number.

[41] Huffman (above, n. 3) 203–4 with 211–14. However, in Burkert's view, "to the Pythagoreans number philosophy is cosmogony" (above, n. 2, 36 and discussion 31–40). The generation of the number series is identical with the generation of the cosmos. (Cf. Aristotle, *Metaph.* 986a2–3: "They supposed … the entire heaven to be a musical scale and a number.") Burkert is in agreement with Ross: "The Pythagoreans are trying to describe at one moment the formation of the number system and that of the physical universe, which is just what on their principles they were bound to do. The number One is identified with the central fire, as two was with the earth and seven with the sun." See W. D. Ross, *Aristotle's Metaphysics* (Oxford 1924) vol. 2, 484.

If Philolaus's principles and derived entities do not include numbers, it follows, barring some gross misunderstanding on the part of Aristotle,[42] that none of the Aristotelian texts that refer to numbers or their principles is based on Philolaus. This will exclude, in addition to the fragments already discussed (**N1**, **N2**, **N3**, **N4**, **N7**, **N9**, **N10**, and **N13**), **N5**, **N6**, **N11**, **N12**, and some of the claims in **N8.** In other words, if this is true, then virtually none of Aristotle's remarks have to do with Philolaus.[43]

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[42] Huffman argues that Aristotle did grossly misunderstand Philolaus. He is "almost certain" that **N12** refers to Philolaus **B7** ("The first thing fitted together, the one in the center of the sphere, is called the hearth"), which, Huffman argues, "is the beginning of Philolaus's account of the generation of the cosmos from limiters and unlimiteds." **N12** "could very easily be understood as a commentary on this fragment." (Quotations from Huffman, above, n. 3, 62.) Huffman goes on to argue that Aristotle's claims that the Pythagoreans believed **N1** and **N2** are misinterpretations of the cosmology. However, on the Ross-Burkert view (see n. 41), it is possible to agree with Huffman that **N12** refers directly to Philolaus **B7**, and yet see it as describing the first stage in the generation of the number series (as well as being the first stage in the generation of the cosmos).

[43] Huffman, on the other hand, finds that "all the basic conceptual terms which Aristotle assigns to the Pythagoreans are also found in Fragments 1–7 of Philolaus … these concepts of limit, unlimited, harmony, number (divided into the even, the odd, and the even-odd) and the generation of the cosmos around a central fire"; Huffman (above, n. 3) 28–9. Likewise, "it seems pretty implausible to me to suppose that Aristotle is basing his account of Pythagoreanism on a book by a different Pythagorean, of whom we have no knowledge, and who used all the same concepts as Philolaus, but who differed by explicitly equating the even and odd with limiters and unlimiteds. Certainly, it is more reasonable to explain Aristotle's difference from what is found in the fragments of Philolaus as the result of his interpretation of what is going on there, especially since we have ample evidence that Aristotle typically presents the views of others under a heavy interpretation" (ibid. 183). Whether this is a strong argument for the thesis that Philolaus's treatise is Aristotle's source for the Pythagoreans will depend on how closely Aristotle's reports of Pythagorean views tally with Philolaus's fragments. If there is substantial disagreement, then Aristotle's source is unlikely to be Philolaus. Even a great deal of agreement does not prove that Philolaus was Aristotle's source in view of the real possibility that what Aristotle and Philolaus have in common was passed down to Aristotle through other Pythagorean sources. In fact, the surest evidence that Aristotle used Philolaus would be cases where he agrees with Philolaus and disagrees with other Pythagorean sources—but the absence of relevant early Pythagorean sources other than Philolaus prevents us from identifying such cases.

On the other hand, if Philolaus includes mathematical entities, and numbers in particular, in the classification "the entire cosmos and all the things in it," some of the Aristotelian material fits well with Philolaus's views on principles. **N5** is a clear case. Limiters and unlimiteds will be the principles of mathematical entities as well as of other entities, and so they will be the principles of "all the things that are" (excluding the principles themselves, of course). The same holds for **N6** to the extent that **N6** is a restatement of **N5.**[44] Some headway can be made towards a Philolaic reading of **N11** and **N12**, but problems still remain, principally that the generation of entities described there does not obviously accord with Philolaus's ontology.

On the state of the evidence, it seems that Aristotle's testimonia on Pythagorean principles have little basis in Philolaus's doctrines. Could they, then, have come from other sources? Even though, as Huffman shows, it is unclear what other sources than Philolaus's book were at Aristotle's disposal, this problem is far less difficult than the problems that the Philolaic interpretation brings, namely, why are so many of Aristotle's testimonia so remote from what we know of Philolaus and why does Aristotle not attribute the relevant views to Philolaus by name?

6. Aristotle's Other Sources

I will now present a consideration that points to an answer to this remaining question. As we know, some people and quite a few philosophers lived to ripe old ages in ancient Greece. Xenophanes reached at least 92, Democritus 90, Plato 80. The *Macrobii*, a work attributed to Lucian, devotes three chapters (18–20) to enumerating long-lived philosophers. One of them is Xenophilus, who was one of the Pythagoreans that Aristoxenus met[45] and who is reported to have lived in Athens to the age of 105 years. Interestingly, if Democritus was born in 460, he was 76 when Aristotle was born in Stagira, not far from Abdera. It is entirely possible from the chronological point of view that as a boy Aristotle personally met Democritus, who we think of as a presocratic philosopher! Could he then have met any Pythagoreans?

Huffman puts Philolaus's birth between 470 and 440 and presents evidence that he was still alive in 388, just four years before Aristotle's birth.[46] This would provide 388 as a *terminus post quem* for his death, but it offers no evidence at all for how much later than 388 he died. In fact the evidence for dating his birth as early as 470 is weak. It consists principally of statements that Philolaus was the teacher of Eurytus and that he and Eurytus were the teachers of the last of the Pythagoreans, who include Echecrates, who is a (younger? older?) contemporary of Plato (born c. 428).[47] Huffman discusses the evidence, but makes some assumptions which, although they are in general reasonable, need not hold in a given case. For example, he assumes that teachers are older than their students, and allows a ten or twenty year age difference. But it is not always true that teachers are older than their students, and it frequently happens that if they are older they are not much older. Moreover, it is not always clear what "teacher" and "student" mean in ancient contexts. The claim is typically of the form "so-and-so 'heard' (ἤκουσε or διήκουσε) so-and-so" or "so-and-so 'was a hearer' (ἀκροατής) of so-and-so." If Philolaus had written a philosophical book and expounded it to others, might that not be enough to qualify them as having "heard" him, no matter what their relative ages? And is there any good reason to think that Philolaus could not have written such a book by the time he was twenty or thirty? So if Philolaus was in fact born as late as 440, he would have had plenty of time to have been "heard" by the people who are said to have heard him. In addition, he would have been only 52 in 388, and only 73 when Aristotle came to Athens in 367. He might have lived another twenty years beyond that—and attended Plato's funeral.[48] On this accounting there is no reason why Aristotle could not have met Philolaus himself. The case is even easier to make for the possibility of his meeting later Pythagoreans such as Simmias, Cebes, and Echecrates, together with the other members of the group known as the last generation of Pythagoreans, especially the long-lived Xenophilus, who for all we know was Aristotle's next door neighbor in Athens. In any case if Aristoxenus, whose birth is placed in the period 375–360 (which makes him nine to twenty-four years younger than Aristotle), met these last Pythagoreans, there can be no objection to supposing that his teacher Aristotle could have met them too. He surely had contact with Aristoxenus himself, and in the context of the Academy and the Lyceum there may have been no shortage of people who, if not Pythagoreans themselves, were familiar with their views. Aristotle might even have used Aristoxenus' book on the Pythagoreans as his source.

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[44] See p. 103.

[45] D.L. 8.46.

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[46] Huffman (above, n. 3) 2–5.

[47] See Plato, *Phaedo* 57a-b.

[48] The following true story is indicative of how far back we can go in time in only a few steps. My fourteen-year-old daughter has an English friend who once told me that her grandfather's grandmother's gardener, who was a very old man, reported that *his* grandfather said that the admiral was a very great man indeed. Then she asked me who the admiral in question was. I ventured a guess: "Nelson?" "No," she said. "It was Drake." So in a very few steps (just four jumps in time back from my daughter's friend) we are back in touch not with the hero of Trafalgar, whose two hundredth anniversary is being celebrated this year (2005), but with contemporaries of the man who destroyed the Spanish Armada in 1588. We can imagine how this works out without any stretch of the imagination. My daughter was born in 1991. My daughter's friend was born in 1924. Her father was born around 1885. So her grandfather could have been born around 1835. His grandmother could have been born eighty years earlier in 1755. The gardener could have been 85 years older than her, so born in

Clearly, Aristotle found out about Pythagorean views from somewhere. Either he had access to written texts now unknown or he may have found out from one or more people who claimed to know. He knew about and reported some views that are unlikely to have come from Philolaus's book, for example the reports about Eurytus's pebbles (which is in fact said to have been reported by Archytas[49]) and the doctrine of the parallel columns. And it is far from clear that Philolaus pursued the program of identifying numbers with such things as justice, marriage, and "the right moment" (*Metaph.* 1078b22–3).[50] If the doctrine of the ten planets (including the counter-earth) moving round the central fire belongs to Philolaus,[51] then the view Aristotle attributes to "some Pythagoreans," that "the comet is one of the plan-

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1670. And his grandfather could have been born eighty years earlier in 1590. When he was a boy he would surely have heard from his family and acquaintances about the greatness of the Admiral, who died in 1595. A similar concatenation of acquaintances could mean that Aristoxenus' informant Xenophilus and Philolaus as well could have associated with Pythagoreans who had known Pythagoras personally.

[49] See n. 19.

[50] Huffman (above, n. 3) 286–8 floats the possibility, but his discussion is far from proving the case.

[51] Aristotle (attributes this cosmology to "the Pythagoreans" but Aëtius attributes it to Philolaus in particular, Aëtius 2.7.7 (= Stobaeus, *Ecl.* 1.22.1d, DK 44 A16), 3.11.3 (= [Plutarch], *Placita* 895E; DK 44 A17), 3.13.2 (= [Plutarch], *Placita* 896 A, DK 44 A21).

ets"[52] cannot be his unless he is guilty of gross inconsistency. The same is very likely to hold for a number of other cases, quoted above in Section 2, where Aristotle attributes views to "some Pythagoreans," as if to imply that there are other Pythagoreans who do not share them. In addition, Aristotle reports the view that "the universe and all that is in it is determined by the number 3, since beginning, middle, and end give the number of the universe and the number they give is the triad" (*Cael.* 268a11), which seems to conflict with the importance the number 10 is given in the cosmology that includes the counter-earth. It may be significant that at one point he refers to "*some* of the Pythagoreans" as constituting all nature out of numbers and putting the heaven together out of numbers (*Cael.* 300a14–17) (as if some Pythagoreans did not) and at another he talks about "those of the Pythagoreans who declare 'the one' to be the element and principle of the things that are; those people suppose that numbers have magnitude." (*Metaph.* 1080b30) (again, as if not all Pythagoreans shared that view about principles).

Could this information have come from Philolaus's book? I think it unlikely, since the surviving fragments do not give the impression that Philolaus was concerned to set out the views held by all Pythagoreans past and present, or any views other than his own. It seems to present and argue for Philolaus's own theories rather than provide a digest of views—even conflicting views—held by various Pythagoreans. In these circumstances, the conclusion that Aristotle somehow or other had access to a separate written or oral tradition becomes attractive, maybe even inescapable.

7. Aristotle's presentation of Pythagorean views

An examination of the passages in which these testimonia occur bears out Huffman's remark that Aristotle tells a story about Pythagorean views on principles.[53] In some cases we can deconstruct the story and see how Aristotle put it together to form the interpretation that he uses in his own discussions. The following account of the four passages from the *Metaphysics* that contain Aristotle's discussions (as opposed to isolated remarks) of Pythagorean views on principles and on the relation between numbers and things (**C1:** 985b23–986a21, **C2:** 987a13–27, **C3:** 1083b8–13 & b17–19 and **C4:** 1090a20–5, a32–5) aims to offer a precise translation and a commentary that explicates Aristotle's train of thought in his account of Pythagoreanism. The interpretations given in the commentary will provide the basis of the subsequent attempt to understand Aristotle's remarks on Pythagorean principles and on the relations between numbers and things (**N1**-**N13**) and to assess their trustworthiness (Section 8).

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[52] Aristotle, *Mete.* 342b30. Huffman (above, n. 3) 240 recognizes the incompatibility and comments that the field of astronomy "is one of the areas of Pythagorean thought where we have clearest evidence of divisions among Pythagoreans" (ibid., 239), but he does not acknowledge the problem this raises for his thesis that Philolaus was Aristotle's source.

[53] "It is clear that he is not just presenting a list of Pythagorean doctrines, but rather telling a story that attempts to make sense of the Pythagorean outlook as a

C1 *Metaph.* 985b23–986a21

> ἐν δὲ τούτοις καὶ πρὸ τούτων οἱ καλούμενοι Πυθαγόρειοι τῶν μαθημάτων ἁψάμενοι πρῶτοι ταῦτά τε προήγαγον, καὶ ἐντραφέντες ἐν αὐτοῖς [**C1.1**] τὰς τούτων ἀρχὰς τῶν ὄντων ἀρχὰς ᾠήθησαν εἶναι πάντων. ἐπεὶ δὲ [**C1.2**] τούτων οἱ ἀριθμοὶ φύσει πρῶτοι, [**C1.3**] ἐν δὲ τούτοις ἐδόκουν θεωρεῖν ὁμοιώματα πολλὰ τοῖς οὖσι καὶ γιγνομένοις, μᾶλλον ἢ ἐν πυρὶ καὶ γῇ καὶ ὕδατι, ὅτι [**C1.4**] τὸ μὲν τοιονδὶ τῶν ἀριθμῶν πάθος δικαιοσύνη τὸ δὲ τοιονδὶ ψυχή τε καὶ νοῦς ἕτερον δὲ καιρὸς καὶ τῶν ἄλλων ὡς εἰπεῖν ἕκαστον ὁμοίως, ἔτι δὲ [**C1.5**] τῶν ἁρμονιῶν ἐν ἀριθμοῖς ὁρῶντες τὰ πάθη καὶ τοὺς λόγους,—ἐπεὶ δὴ [**C1.6**] τὰ μὲν ἄλλα τοῖς ἀριθμοῖς ἐφαίνοντο τὴν φύσιν ἀφωμοιῶσθαι πᾶσαν, [**C1.7**] οἱ δ' ἀριθμοὶ πάσης τῆς φύσεως πρῶτοι, [**C1.8**] τὰ τῶν ἀριθμῶν στοιχεῖα τῶν ὄντων στοιχεῖα πάντων ὑπέλαβον εἶναι, καὶ [**C1.9**] τὸν ὅλον οὐρανὸν ἁρμονίαν εἶναι καὶ ἀριθμόν· καὶ [**C1.10**] ὅσα εἶχον ὁμολογούμενα ἔν τε τοῖς ἀριθμοῖς καὶ ταῖς ἁρμονίαις πρὸς τὰ τοῦ οὐρανοῦ πάθη καὶ μέρη καὶ πρὸς τὴν ὅλην διακόσμησιν, ταῦτα συνάγοντες ἐφήρμοττον. κἂν εἴ τί που διέλειπε, προσεγλίχοντο τοῦ συνειρομένην πᾶσαν αὐτοῖς εἶναι τὴν πραγματείαν· λέγω δ' οἷον, ἐπειδὴ τέλειον ἡ δεκὰς εἶναι δοκεῖ καὶ πᾶσαν περιειληφέναι τὴν τῶν ἀριθμῶν φύσιν, καὶ τὰ φερόμενα κατὰ τὸν οὐρανὸν δέκα μὲν εἶναί φασιν, ὄντων δὲ ἐννέα μόνον τῶν φανερῶν διὰ τοῦτο δεκάτην τὴν ἀντίχθονα ποιοῦσιν. διώρισται δὲ περὶ τούτων ἐν ἑτέροις ἡμῖν ἀκριβέστερον. ἀλλ' οὗ δὴ χάριν ἐπερχόμεθα, τοῦτό ἐστιν ὅπως λάβωμεν καὶ παρὰ τούτων τίνας εἶναι τιθέασι τὰς ἀρχὰς καὶ πῶς εἰς τὰς εἰρημένας ἐμπίπτουσιν αἰτίας. φαίνονται δὴ καὶ οὗτοι τὸν ἀριθμὸν [**C1.11**] νομίζοντες ἀρχὴν εἶναι καὶ

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whole. This story is necessarily selective and leaves out important points in order to preserve coherence"; Huffman (above, n. 3) 179.

> ὡς ὕλην τοῖς οὖσι καὶ ὡς πάθη τε καὶ ἕξεις, [**C1.12**] τοῦ δὲ ἀριθμοῦ στοιχεῖα τό τε ἄρτιον καὶ τὸ περιττόν, τούτων δὲ τὸ μὲν πεπερασμένον τὸ δὲ ἄπειρον, τὸ δ᾽ ἓν ἐξ ἀμφοτέρων εἶναι τούτων (καὶ γὰρ ἄρτιον εἶναι καὶ περιττόν), τὸν δ᾽ ἀριθμὸν ἐκ τοῦ ἑνός, [**C1.13**] ἀριθμοὺς δέ, καθάπερ εἴρηται, τὸν ὅλον οὐρανόν.

Those called Pythagoreans took hold of mathematics; they were the first to advance that study, and being brought up in it they believed that [**C1.1**] the principles of these things[54] are the principles of all the things that are. Since [**C1.2**] numbers are naturally the first among mathematical entities,[55] and [**C1.3**] in these [viz. numbers] they thought they observed many likenesses to the things that are and that come to be—more than in fire and earth and water—[**C1.4**] such and such an attribute of numbers being justice, another being soul and mind, another being "the right moment," and similarly for virtually all other things; since, again, [**C1.5**] they saw the attributes and the ratios of the harmonic intervals in numbers; since, then, [**C1.6**] all other things seemed to be made in the likeness of numbers in their entire nature and [**C1.7**] numbers seemed to be primary in all nature, they supposed [**C1.8**] the elements of numbers to be the elements of all the things that are, and [**C1.9**] the entire heaven to be a musical scale[56] and a number. And [**C1.10**] all the characteristics of numbers and harmonic intervals that they found corresponding to the attributes and parts of the heaven and to the entire ordering they collected and made them fit. If anything was missing anywhere they eagerly filled in the gaps to make their entire system coherent. For example, since they think the number ten is something perfect and encompasses the entire nature of numbers, they declare that the bodies that move in the heaven are also ten, but since only nine are visible they invent the counter-earth as the tenth. I have discussed these matters more precisely elsewhere.

My purpose in pursuing this topic here is that we may understand for these people too what they posit to be the principles and how they fall under the causes I have mentioned. Evidently, then, these people too consider that [**C1.11**] number is the principle both as matter for the things that are and as their attributes and states, and they hold that [**C1.12**] the elements of number are the even and the odd, and of these the former is unlimited, and the latter limited. "The one" is "from" (ἐκ) both of these (for it is both even and odd) and number is "from" (ἐκ) "the one"; and [**C1.13**]

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[54] The principles of mathematics are definitions, axioms, and hypotheses; but as the sequel shows (**C1.8**, **C1.11-C1.12**) Aristotle is here talking not about the principles of mathematics but about the principles of mathematical entities. See below, p. 83.

[55] Since numbers have principles **C1.8**, they cannot be first principles, as Ross's translation ("Since of these principles numbers are by nature the first," in the Revised Oxford Translation) has it. The antecedent of τούτων in b26 is to be inferred (as with τούτων in b25) from τῶν μαθημάτων (b24).

[56] For this translation of ἁρμονία, see below, n. 73.

> the entire heaven, as has been said, is numbers. (tr. based on the Revised Oxford Translation, with significant modifications)

C1 begins with the well known statement that the Pythagoreans were the first to make serious progress in mathematics. The fact that that modern scholarship has rejected[57] this claim is a serious blow to the credibility of Aristotle's account of Pythagorean principles, since he bases it on their alleged interest in mathematics. Still, one need not be a serious mathematician in order to have a serious interest in numbers; indeed a fascination with numbers and their power is widespread among peoples who have not developed mathematics to any notable degree.[58]

Aristotle gives a tidy picture. The Pythagorean interest in mathematics led them to conclude that the principles of mathematical entities are the principles of all the things that are **C1.1.** They reasoned that since numbers are the primary kind of mathematical entities **C1.2** and numbers are the first things in the whole of nature **C1.7**,[59] the elements of numbers are the elements of all the things that are **C1.8**, which is a restatement of **C1.1** (with "elements" apparently used as a synonym of "principles"[60]). Aristotle mentions some of the connections the Pythagoreans discovered between numbers and things which could be used in support of **C1.7:** first, "likenesses" between numbers and the things that are **C1.3**, with examples **C1.4**, and second, attributes and ratios of harmonic intervals which they discovered in numbers **C1.5.** Consequently (δή)[61] all other things appeared to be made in the likeness of numbers **C1.6**, and numbers seemed to be primary in all nature **C1.7.**

The first thing to notice is that Aristotle presents two different kinds of grounds for the view that the principles or elements of number are the principles or elements of all things. First, **C1.3-C1.4** that "they thought that they observed" that some attribute of numbers was justice, another attribute was soul and mind, and still another was "the right moment." Second, **C1.5** that "they saw" the numerical properties of harmonic intervals. How large was the difference between the second kind of grounds and the first can be judged from Alexander's explanation in his comment on this passage.

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[57] Following Burkert's lead (above, n. 2) part VI.

[58] For examples see Burkert (above, n. 2) 468 ff.

[59] **C1** makes no distinction between things that are and things that are in nature. All entities are natural entities. Further the passage implies that for the Pythagoreans mathematical entities are natural objects. Numbers are the first things in nature **C1.7** and they are also the first mathematical entities **C1.2.**

[60] See p. 85.

[61] Or possibly "indeed," in which case **C1.6** is not presented as a consequence of **C1.4** and **C1.5**, but as further evidence for **C1.7.**

> They supposed that requital and equality were characteristic of justice and they found these features in numbers, and so declared that justice was the first number that is equal-times-equal.…They said that "the right moment" is the number 7, since things which are natural appear to have their decisive moments of fulfillment in birth and growth by sevens. Humans, for example. They are born in the seventh month and teethe in as many months, and reach adolescence in the second span of seven years and get a beard in the third … They said that marriage is the number 5, because marriage is the union of male and female, and according to them the odd is male and the even is female, and this number is the first which has its origin from 2, the first even number, and 3, the first odd.… They declared mind and substance to be "the one,"[62] since he spoke of the soul as the mind. They said that because it is stable and similar in every way, and sovereign, the mind is the unit and "the one"; and substance is the first thing. (Alexander *in Metaph.* 38,10–39,15)

The ways in which justice, "the right moment," marriage, soul/mind and substance are associated with numbers are very different from one another, and can justifiably be called fanciful (cf. Aristotle's "*they thought* that they observed" [ἐδόκουν θεωρεῖν]). They have virtually nothing to do with mathematics. It appears that the Pythagoreans were determined to make things fit their theory by hook or by crook. On the other hand, the attributes and ratios of the harmonic intervals (2:1 for the octave, 3:2 for the fifth, 4:3 for the fourth) are derived systematically, have a basis in nature (cf. "they saw" [ὁρῶντες] and can be used to make certain kinds of mathematical calculations.[63] On the basis of this kind of evidence, goes Aristotle's story, the Pythagoreans concluded that all other things appeared in their entire nature to be likened after numbers **C1.6.** This broad generalization is the kind of move Aristotle attributes to other presocratic philosophers as well.[64]

The second thing to notice is that Aristotle says neither that the Pythagoreans held that justice *is* a number but that "such and such an attribute of numbers" is justice,[65] nor that they claimed that the attributes and ratios of harmonic intervals *are* numbers, but that they saw those attributes and ratios *in* numbers, by which I think he must mean that they saw that numbers have the same attributes and ratios as are found in the harmonic intervals. Passage **C1** makes better sense if we keep this in mind. At this point he is recounting the grounds on which the Pythagoreans founded their strange view that the principles of numbers are the principles of all things. The numerical basis of the harmonic intervals was a real discovery, not a fancy. Also, the common points between, say, justice and the number four, although perhaps arbitrarily chosen, are comprehensible; and these discoveries are described in a way that does not commit the Pythagoreans from the outset to any strange views at all. The strangeness comes in first with **C1.6** and more so with the conclusions in **C1.7** and **C1.8.**

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[62] In this context, "the one" must mean the number one.

[63] For example, the octave C-C⋆ is the sum of the intervals C-G and G-C⋆ (respectively a fifth and a fourth), and the ratio of the octave is the product of the ratios of the fifth and fourth (2:1 = 3:2 x 4:3).

[64] Cf. Aristotle's conjectures about Thales's grounds for claiming that water is the material principle of things (*Metaph.* 983b22–27, quoted below, p. 114).

C1.6 is not simply a generalization of **C1.3.** The earlier claim that numbers have likenesses (ὁμοιώματα) to things is symmetric. If A is like B in some respect, then B is like A too, in the same respect. In particular if some thing and some number have some attribute in common, so that the number has a likeness to the thing,[66] then by the same token the thing has a likeness to the number. But being made in the likeness of (ἀφομοιοῦσθαι) is an asymmetric relation: if A is made in the likeness of B, then B is in some way the original and A the copy.

C1.7 contains an important element of Aristotle's account. Since for Aristotle nature involves change whereas numbers are unchanging, numbers are not part of nature;[67] for the Pythagoreans they are. This distinctively Aristotelian use of "nature" appears here as a key word in his description of the Pythagorean view; that they included numbers as part of nature will follow from the view that they considered numbers to be the basis of natural phenomena as recounted in **C1.4**, **C1.5**, and especially **C1.6.**

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[65] However, he says elsewhere that they identified opinion, "the right moment," injustice, decision, and mixture with particular numbers (*Metaph.* 990a23–24). The difference corresponds to the differences between Stages 1 and 2 in the developmental account of Pythagorean thought about principles which I give below, p. 101.

[66] Note that **C1.3** says that "in these [viz. numbers] they thought they observed many likeness to the things that are" and not "in the things that are they observed many likenesses to numbers."

[67] For example, *Metaph.* M.3, 1078a2–9: mathematics deals neither with sensible things *qua* sensible … but with sensible things *qua* lines and planes (a paraphrase).

At this point we have the materials needed to reach the desired conclusion **C1.1** as rephrased in **C1.8**, that the elements of numbers are the elements of all the things that are. The reasoning is easy enough to follow, although somewhat loose. We start with **C1.2**, that numbers are by nature the first among mathematical entities. Then the additional claim **C1.3**, that in numbers they supposed that they observed many likenesses to the things that are and that come to be, is supported by **C1.4** and **C1.5. C1.6**, the general statement that all other things appear in their entire nature to be likened after numbers, resembles **C1.3**, with the addition of the significant word "nature," which here refers to the "nature" of particular (sorts of) things.[68] But it says more than **C1.3.** The point is no longer that the things that are *like* numbers somehow or another and in various ways, but that they are *likened after* numbers: numbers are the model, the original, the prototype. And they are likened after numbers *in their entire nature.* The properties of a thing that are likened after numbers are not just some of the properties it might chance to have; they are all the properties that constitute its nature.

C1.7 follows from **C1.2** and **C1.6.** Since by **C1.6** not only are things like numbers, but also, as the prototypes of things, numbers have priority; and further since (again by **C1.6**) this claim holds for "all other things," it follows that numbers are the first things in the whole of nature. For in the first place they are prior to all things that *Aristotle* would consider to be natural entities.[69] And second, as I pointed out above, he interprets the Pythagoreans as holding that numbers are natural things. For the Pythagoreans, then, the category of natural things will include not only what Aristotle places in that category but numbers as well, together with other mathematical entities. And since by **C1.2** numbers are by nature the first among mathematical entities, it follows that they are the first among natural entities, or, as **C1.7** puts it, the first things in the whole of nature.

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[68] "Nature" in this sense may approximate to Aristotle's technical notion of essence. Cf. Aristotle, *Metaph.* 1014b35–1015a13. Aristotle may have meant (anachronistically) to ascribe this idea to the Pythagoreans, but he may have chosen the less technical word "nature" to convey a less precise idea, perhaps amounting to the basic or most significant or notable properties of a thing.

[69] I refer to what Aristotle describes as "things that are by nature" and "things that have a nature" (*Phys.* 192b8, b32) in the sense of having an internal principle of change and rest (ibid. 192b13–14).

Finally, **C1.2** and **C1.7** yield **C1.8.** Since by **C1.2** numbers are the first among mathematical entities, it follows that the principles of numbers[70] are the principles of mathematical entities; since by **C1.7** numbers are the first things in the whole of nature, we reach the desired conclusion **C1.8** that the elements of numbers are the elements of all the things that are, which is apparently intended as equivalent to the original thesis **C1.1** that the principles of mathematical entities are the principles of all things.[71]

The immediately following claim **C1.9** that the entire heaven is a musical scale and a number, has no direct relation to the preceding discussion despite its immediate syntactical connection to **C1.8.**[72] It is not concerned with principles of things or numbers, and it is the only part of passage **C1** that identifies a physical entity with a number. In fact, it identifies it as a number and a *harmonia*,[73] which implies that it takes harmonies to be numbers, an identification not found in **C1.5. C1.9** introduces **C1.10**, which gives an example of the way in which the Pythagoreans in question enthusiastically applied their mathematical ideas to nature. The importance they gave the number ten led them to invent a tenth celestial body since they could only find nine.

The final section of **C1**, **C1.11**-**C1.13**, is not a passage of continuous exposition like **C1.1**-**C1.10.** It presents difficulties. The material immediately preceding **C1.11** suggests that Aristotle will state how the Pythagorean doctrine on principles fits in with his own doctrine of four causes—but that is the topic of only part of **C1.11**; **C1.12** provides new information on their views on principles, and **C1.13** repeats material stated above whose connection with what is said in **C1.11** and **C1.12** is not obvious.

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[70] There may be a shift here between two notions of principle: the principles of an entity (number) and the principles of a science (mathematics). (See n. 54.) A charitable reading would take **C1.1** as speaking about the principles of mathematical entities.

[71] See above, p. 80.

[72] **C1.9** also introduces a thesis that will be important later on. See the discussion of **C1.13** below.

[73] In **C1.5** ἁρμονία is translated "harmonic interval," referring, for example, to the interval of the octave. Here, assuming that the reference is to the "harmony of the spheres," it refers to a system of harmonic intervals embodied in particular musical notes, hence something close to a musical scale.

C1.11 states that the Pythagoreans evidently[74] held that number[75] is the principle both as matter for the things that are and as their attributes and states. This is a problematic passage, first because nothing in the preceding discussion indicates that numbers are the material causes of things, and second because attributes and states of things are not in Aristotle's view principles or causes, and further, because the preceding discussion has not said that the attributes and states[76] of things are numbers. Regarding the first problem, even though **C1.8** speaks of elements, which in Aristotle are frequently *material* elements,[77] it is hard to see how numbers can be thought of as material constituents of justice, soul/mind, "the right moment," or harmonic intervals, which are the evidence on which **C1.8** is based, particularly because **C1.6**, which is a premise for **C1.8**, speaks only in terms of things being likened after numbers – and this is far from saying that they are composed of numbers. Worse, **C1.8** does not say that *numbers* are the elements of things, but that the *elements of number* are, so even if "elements" suggests the material cause, the doctrine expressed in **C1.8** is distinctly different from that in **C1.11.**

The second problem is similar. The preceding material has spoken of likenesses between numbers and things **C1.3**, which amounts to numbers and things having the same attributes. It has declared that things are made in the likeness of numbers **C1.6** and has indicated that numbers are prior to things **C1.7.** It has even identified the entire heaven with a number **C1.9.** But it has not said straightforwardly that the attributes of things are numbers or that numbers are the principles of things as their attributes and states. I understand "states" to be an Aristotelian term for relatively permanent attributes of things.[78] Again, these are different doctrines from what we already know, and they are not justified by the earlier claims.

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[74] Aristotle's caution here (φαίνονται νομίζοντες) is a good indication that at least in **C1.11** we have Aristotle's verdict rather than anything necessarily closely based on Pythagorean sources.

[75] Note the shift to "number" from "numbers" in the parallel passage **C1.8.** I do not find any difference in meaning. In the passages I am investigating, the plural is used more often than the singular, but I have not been able to discover that Aristotle intends anything by using now one and now the other. The most important passages are **C1.2**,**C1.4**, **C1.5**, **C1.6**, **C1.7**, **C1.8**, **C1.10**, **C1.13**, **C3.1**, **C3.3**, **C4.1**, **C4.2**, **C4.4**, **C4.5**, **C4.6**, plural) and **C1.11**, **C1.12**, **C2.4**, **C3.1**, **C3.2** (singular).

[76] Even the mention of states (ἕξεις) is unjustified. **C1.4** and **C1.5** mention attributes (πάθη), but not states.

[77] This is the second meaning of στοιχεῖον given in *Metaph.* Δ.3 (1014a31–35). According to Diels, this is the most common meaning of the word in Aristotle (H. Diels, *Elementum* [Leipzig 1899] 25).

C1.12 seems to be the immediate continuation of **C1.8** with its reference to the elements of number, as if **C1.9** through **C1.11**[79] had not intervened. It identifies the even and the odd as the elements of number,[80] describes those elements as unlimited and limited (respectively), and seems to declare the even and the odd to be principles of "the one"[81] and "the one" to be the principle of number. The wording of this last claim presents difficulties:[82] it declares "the one" to be "from" (ἐκ) the even and the odd, and number to be "from" "the one." Aristotle standardly uses the preposition ἐκ to refer to the material cause, but it is difficult to understand how the even and the odd can be material causes of "the one" and how "the one" can be the material cause of number, as **C1.12** would be saying on this way of understanding ἐκ.

However, if we can make sense of **C1.12** with this interpretation of ἐκ, some of the problems associated with **C1.11** will be solved. To begin with, it would be as hard for Aristotle, as it is for us to understand how the even and the odd can be material causes of "the one" and how "the one" can be the material cause of number. Since the preceding material (other than the as yet unjustified claim that number is the principle as matter for the things that are) would give Aristotle no reason to think that material causes are under discussion, the most plausible explanation is that Aristotle had a Pythagorean source for the views expressed in **C1.12** and that that source probably made use of the ἐκ locution. If he did, he would be justified in mentioning that view here as relevant to his concern to locate in earlier philosophers antecedents of his own theory, even though that claim does not emerge clearly from the discussion at **C1.1-C1.10.** And since it is virtually inconceivable that he would have invented the ontology sketched in **C1.12**, I consider it certain that Aristotle had a Pythagorean source for the claims expressed there. And they justify the surprising assertion of **C1.11** that number is the material cause of the things that are. We have a system in which the even and the odd (which are somehow related to the unlimited and the limited[83]) are ultimate principles. They are the immediate principles of "the one";[84] "the one" is the immediate principle of number. And in all these cases the notion of principle in play is that of the material cause.

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[78] For ἕξις in this sense, see *Cat.* 8b7–8.

[79] Or perhaps just **C1.11.**

[80] For the singular, see n. 75 above.

[81] I take this expression to mean the number one (which the Pythagoreans did not regard as a number). See n. 16.

[82] Ross's mistranslation of ἐκ as "proceeds from" is a reflection of these difficulties.

C1.13 repeats **C1.9** almost verbatim, except that it omits mention of the musical scale and says that the heaven is numbers rather than number.[85] Following the claim in **C1.12** that number is "from" (ἐκ) "the one," **C1.13** completes the ontology. By asserting that the entire heaven is numbers it links the sensible world with the preceding levels. Although it does not state so explicitly, it seems to indicate that numbers are the principles of the sensible world; we already have something close to this claim in **C1.7**, that numbers seemed to be primary in all nature.

There remains the problem raised by the assertion in **C1.11** that number is a principle as the attributes and states of things that are. As with the first problem, it is possible to ascribe it to a separate Pythagorean source, but there is no need for this expedient, since it can be seen as recapitulating points made earlier in the passage. Since numbers are primary in nature **C1.7** Aristotle might well call them principles of other entities. And he might well have interpreted the thesis that other entities are made in the likeness of numbers in their entire nature **C1.6** to include their being made in the likeness of number in their attributes and states, that is to say, that numbers have the same attributes and states that other entities do. Thus, the principles of things would be numbers as having the attributes of those things. Further, some of the things identified in **C1.4** with attributes of numbers (justice, "the right moment") are themselves attributes rather than substances, which is another reason for saying that numbers are the principles of the attributes and states of things. For these reasons I am inclined to see this claim of **C1.11** as an Aristotelian interpretation of Pythagorean views.

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[83] See discussion of **C2** below.

[84] **C1.12** includes an explanation of why the even and the odd are principles of the number one: the number is both even and odd. The reason Aristotle gives for this claim is that when one is added to an even number the result is an odd number and when it is added to an odd number the result is an even number (Aristotle Frag. 199, ap. Theo Smyrn. *de math. ap. Plat.* p. 22, 5 Hiller). This explanation is unsatisfactory by itself, since it holds for all odd numbers. However, one is the *first* number which has this property, and so, the principle stated in **C2.6** and exemplified by two and double implies that the number one is identical with that property. Also, this explanation supports the interpretation advanced below (p. 89) that (at least in some cases) the Pythagoreans held that if one thing is a principle of another, then the former is predicated of the latter.

[85] The difference between "numbers" in **C1.13** and "number" in **C1.9** seems entirely negligible. See n. 75.

C2 *Metaphysics* 987a13–27

> οἱ δὲ Πυθαγόρειοι [**C2.1**] δύο μὲν τὰς ἀρχὰς κατὰ τὸν αὐτὸν εἰρήκασι τρόπον, τοσοῦτον δὲ προσεπέθεσαν ὃ καὶ ἴδιόν ἐστιν αὐτῶν, ὅτι [**C2.2**] τὸ πεπερασμένον καὶ τὸ ἄπειρον [καὶ τὸ ἓν] οὐχ ἑτέρας τινὰς ᾠήθησαν εἶναι φύσεις, οἷον πῦρ ἢ γῆν ἤ τι τοιοῦτον ἕτερον, ἀλλ᾽ [**C2.3**] αὐτὸ τὸ ἄπειρον καὶ αὐτὸ τὸ ἓν οὐσίαν εἶναι τούτων ὧν κατηγοροῦνται, [**C2.4**] διὸ καὶ ἀριθμὸν εἶναι τὴν οὐσίαν πάντων. περί τε τούτων οὖν τοῦτον ἀπεφήναντο τὸν τρόπον, καὶ [**C2.5**] περὶ τοῦ τί ἐστιν ἤρξαντο μὲν λέγειν καὶ ὁρίζεσθαι, λίαν δ᾽ ἁπλῶς ἐπραγματεύθησαν. ὡρίζοντό τε γὰρ ἐπιπολαίως, [**C2.6**] καὶ ᾧ πρώτῳ ὑπάρξειεν ὁ λεχθεὶς ὅρος, τοῦτ᾽ εἶναι τὴν οὐσίαν τοῦ πράγματος ἐνόμιζον, ὥσπερ εἴ τις οἴοιτο ταὐτὸν εἶναι διπλάσιον καὶ τὴν δυάδα διότι πρῶτον ὑπάρχει τοῖς δυσὶ τὸ διπλάσιον. ἀλλ᾽ [**C2.7**] οὐ ταὐτὸν ἴσως ἐστὶ τὸ εἶναι διπλασίῳ καὶ δυάδι· [**C2.8**] εἰ δὲ μή, πολλὰ τὸ ἓν ἔσται, [**C2.9**] ὃ κἀκείνοις συνέβαινεν.
>
> The Pythagoreans similarly [**C2.1**] posited two principles, but they added something peculiar to themselves, that [**C2.2**] the limited and the unlimited are not distinct natures like fire or earth or anything else of that kind,[86] but that [**C2.3**] the unlimited itself and "the one" itself are the substance (οὐσία) of the things of which they are predicated. This is why [**C2.4**] they call number the substance (οὐσία) of all things. On this subject, then, they expressed themselves thus; and [**C2.5**] regarding the question of what things are (τί ἐστι) they began to make statements and definitions, but treated the matter too simply. For they would define superficially and they thought that [**C2.6**] the first thing an indicated term applies to is the essence (οὐσία) of the thing, as if one were to suppose that double and the number two are the same because two is the first thing double applies to. But surely [**C2.7**] to be double and to be two are not the same; [**C2.8**] otherwise, one thing will be many—[**C2.9**] a consequence which they actually drew. (tr. based on the Revised Oxford Translation)

C2 occurs shortly after **C1**, still in the context of Aristotle's discussion of the principles and causes recognized by earlier philosophers. **C2**, which concludes *Metaphysics* A5 and ends the treatment of the pre-Platonic thinkers, is a brief appendix on two Pythagorean theses as yet unmentioned. Both theses are stated in the Aristotelian language of substance (οὐσία) and essence (οὐσία, τί ἐστιν), predication (κατηγορεῖσθαι), and definition (ὁρίζεσθαι). The first point, treated in **C2.1**-**C2.4**, is closely related to **C1.12.** If read in connection with the earlier claim, this section makes good sense. The two principles mentioned in **C2.1** are the unlimited and the limited, which **C1.12** associates with the even and the odd. Either, then, the unlimited is identical with the even and the unlimited with the odd, or they are different; if they are the same, the unlimited/even and the limited/odd are the ultimate principles; if they are different, the unlimited will be the principle of the even and the limited the principle of the odd.

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[86] For this translation of φύσις, see LSJ s.v. vi. Contrast Ross's more interpretive translation "were not attributes of certain other things, e.g., of fire…"

C2.2 makes the point that the Pythagoreans did not make fire or some other thing of that sort a principle and declare that it was unlimited or limited; rather they made the unlimited and the limited principles *in their own right*. **C2.3** makes this point in Aristotelian idiom, referring to the unlimited itself (αὐτὸ τὸ ἄπειρον), as opposed to an unlimited [amount of] fire, or to fire (which happens to be unlimited).

Where **C2.2** speaks of the limited and the unlimited, **C2.3** speaks of the unlimited itself and "the one" itself. The change is significant and I will discuss it below (pp. 86–7). For the present, I focus on the general point made here, that principles are the substance of the things of which they are predicated. This claim is odd from Aristotle's point of view, since he holds that substances are not predicated of other things.[87] Aristotle may be supposing that the Pythagoreans were committed to the belief that if, say, the unlimited is a principle of something, that thing must have the attribute of being unlimited. We do not at this point have enough information at hand to determine whether this is a reasonable interpretation of Pythagorean doctrine.[88] But in any case, the idea that the unlimited and the limited are the substance of the entities derived from them fits well enough with the claim in **C1.12** that they are the material cause of those entities.[89]

The next thesis, that number is the substance of all things[90] **C2.4**, does not follow from **C2.3** by itself, but it is a reasonable claim to make in the light of the ontology implicit in **C1.** The important thing to recognize is that we are several steps further down the ontological hierarchy from **C2.3**, no longer at the level of ultimate principles but at the derivation of the lowest level from numbers. Where **C1** said that number is the principle as matter for the things that are **C1.11**, **C2** says that number is the substance of all things. The difference between these two claims mirrors the difference between **C1**'s and **C2**'s statements about the unlimited and the limited that were noted at the end of the previous paragraph.[91]

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[87] Aristotle, *Cat.* 2a11–13, *Metaph.* 1029a18–27.

[88] For another place where Aristotle may be attributing a similar way of thinking to the Pythagoreans, see the discussion of **C4** below, p. 94.

[89] See discussion above, pp. 86–7.

[90] For the singular, see n. 75.

The second topic begins at **C2.5.** This topic is advertised in **C2.5** as the Pythagorean contribution to the study of essence and definitions (τί ἐστιν, ὁρίζεσθαι), but these terms do not recur in the passage, which (in continuation of **C2.4**) is principally concerned with the relations between numbers and things, specifically about the way in which numbers are the substance of things. The issue of numbers as principles drops out of sight. The present concern is the *identification* of things with numbers. The example Aristotle provides us in **C2.6** treats the identification of "double" with the number two. The grounds for this identification are that the number two is the first subject to which the attribute "double" applies. It applies to the other even numbers as well, but it is *identified* with the number two, and hence the number two is its substance. The wording suggests that it is not an example that the Pythagoreans themselves used, but that Aristotle thought it was typical of the reasoning that they did use. It is hard to see how this account would work for any of the explanations of the identification of justice, soul/mind, substance, and "the right moment" with numbers that Alexander provides in the passage quoted above (p. 81), since it is unclear in what sense the associated numbers are the first things to which the entities in question apply. Moreover, if Aristotle is right, it is hard to see how more than one thing could be identified with the same number: how can several things be "first"? On the other hand, these considerations by no means indicate that Aristotle was mistaken in attributing this kind of reasoning to the Pythagoreans. In fact, the "by hook or by crook" approach the they used in amassing evidence for their views[92] and the specificity of Aristotle's statement here makes it more likely that he is correct than mistaken.

Aristotle next goes on to make an objection to the practice of identifying things with numbers. The objection is simply that to be double and to be the number two are not the same **C2.7.** The expression "to be so-and-so" (τὸ εἶναι followed by the dative) is one of Aristotle's standard technical ways of referring to essence. He means that the essence of double is different from the essence of the number two, which entails that the definition of two is different from the definition of double—which is indeed the case, even though the definition of double may well contain the word "two." And if they have different essences, they are different. So when the Pythagoreans claim that the double is the number two, they are saying that two different things are the same, and therefore one **C2.8.** This objection does not depend on the possibly non-authentic example of double and the number two, or on the fact that two is the first number to which "double" applies, even though it is stated in the terms of that example. The same result will hold for the other identifications mentioned by Aristotle and expounded by Alexander (for example, that justice is the number four) even if the kind of grounds for identifying double and the number two that Aristotle describes in **C2.6** does not apply in those cases. Aristotle can fairly object that to be justice and to be the number four are not the same thing. This may be enough to justify the comment **C2.9** that the Pythagoreans are committed to this absurdity. But the comment may also reflect the fact that in some cases several things are associated with the same number, as Alexander says that soul/mind and substance are identified with "the one."

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[91] See also p. 107.

[92] Above, p. 81.

C3 *Metaph.* 1083b8–13; b17–19

> ὁ δὲ τῶν Πυθαγορείων τρόπος τῇ μὲν ἐλάττους
> ἔχει δυσχερείας τῶν πρότερον εἰρημένων, τῇ δὲ ἰδίας ἑτέ-
> ρας. τὸ μὲν γὰρ μὴ χωριστὸν ποιεῖν τὸν ἀριθμὸν ἀφαι- 10
> ρεῖται πολλὰ τῶν ἀδυνάτων· [**C3.1**] τὸ δὲ τὰ σώματα ἐξ ἀριθ-
> μῶν εἶναι συγκείμενα, καὶ τὸν ἀριθμὸν τοῦτον εἶναι μαθη-
> ματικόν, ἀδύνατόν ἐστιν. …
> [**C3.2**] ἐκεῖνοι δὲ τὸν ἀριθμὸν τὰ ὄντα λέγουσιν· 17
> [**C3.3**] τὰ γοῦν θεωρήματα προσάπτουσι τοῖς σώμασιν ὡς ἐξ ἐκεί-
> νων ὄντων τῶν ἀριθμῶν.
>
> The Pythagoreans' way [of treating this issue] in one way affords fewer difficulties than those discussed earlier, but in another way has others peculiar to itself. For not making number separate removes many of the impossibilities; but [**C3.1**] that bodies are composed of numbers, and that this is mathematical number, is impossible…. [**C3.2**] They say that the things

> that are, are number. [**C3.3**] In fact [?at any rate][93] they apply their propositions to bodies supposing that [?as if] they[94] consisted of those numbers. (tr. based on the Revised Oxford Translation)

C3 is an important passage for the relation between things and numbers. In it Aristotle speaks of "bodies," that is, physical objects—unlike the "things" he mentioned in **C1:** justice, "the right moment," and the like. The absence of examples in **C3** is sorely felt. It is clear from the context that **C3.1** represents a view Aristotle attributes to the Pythagoreans: that bodies are composed of (ἐκ) numbers (**N1**). Also that **C3.2** represents another such view: that the things that are, are number (**N2**). The question is whether these are two representations of the same view: did they hold both views or only one, and if only one, which one. **C3.3** has been taken to prove that the Pythagoreans attempted to relate properties of number to properties of things, but did not make the relation between numbers and things clear. "Aristotle sees the Pythagoreans applying mathematical speculations to bodies in a way that suggests that they think that the bodies are composed of numbers, and on this basis he ascribes to them the thesis that all things are numbers."[95] The argument goes that **C3.3** shows that Aristotle found no clear statement that the Pythagoreans held **N2. C3.3** gives Aristotle's reason for thinking that the Pythagoreans held **N2**, but in fact **C3.3** requires **N1**, not **N2. N2** is simply Aristotle's misunderstanding.

However, this interpretation is not decisive. It takes γοῦν as having a limitative force ("at least," "at any rate") and ὡς with the genitive absolute as meaning "as if" (in effect, counterfactually). But γοῦν can also have an emphatic force ("in fact," "indeed"), and in several places in Aristotle, in the *Metaphysics* in particular, it can well be translated in this way. Also, ὡς with the participle typically "denotes the thought … in the mind of the subject of the principal verb … without implicating the speaker or writer"[96] and means "in the belief that" or "supposing that." If these alternative ways of taking the two particles are adopted, **C3.3** does not express Aristotle's grounds for supposing that they held **N2.** Instead it expresses the idea that in addition to holding **N2**, they also did something else that stems from their belief (to which Aristotle does not subscribe) that bodies are composed of numbers. In this connection it is worthwhile to note that as in **C3.2** Aristotle typically expresses **N2** as "the things that are (τὰ ὄντα) are numbers," not "bodies are numbers," so the references to "bodies" being composed of numbers in **C3.1** and **C3.3** may be another indication that Aristotle is not inferring **N2** from the consideration advanced in **C3.3.**[97]

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[93] The words in brackets here and in the following line are possible alternative translations, which Huffman adopts. See discussion below.

[94] I take σώμασιν to be the antecedent of ὄντων. See H. W. Smyth, *Greek Grammar* (Cambridge, Mass. 1956) §2072: "The genitive of the participle [in the genitive absolute] may stand without its noun or pronoun," and §2073a: "The genitive absolute may be used where the grammatical construction demands the dative"; cf. Thuc. 1.114.1 διαβεβηκότος ἤδη Περικλέους στρατιᾷ Ἀθηναίων ἠγγέλθη αὐτῷ ὅτι…

[95] Huffman (above, n. 3) 61.

[96] Smyth (above, n. 94) §2086.

C4 *Metaphysics* 1090a20–5; a32–5

> οἱ δὲ Πυθαγόρειοι διὰ [**C4.1**] τὸ ὁρᾶν πολλὰ τῶν ἀριθμῶν πάθη ὑπάρχοντα 21
> τοῖς αἰσθητοῖς σώμασιν, [**C4.2**] εἶναι μὲν ἀριθμοὺς ἐποίησαν τὰ
> ὄντα, [**C4.3**] οὐ χωριστοὺς δέ, ἀλλ᾽ [**C4.4**] ἐξ ἀριθμῶν τὰ ὄντα· διὰ τί δέ;
> ὅτι [**C4.5**] τὰ πάθη τὰ τῶν ἀριθμῶν ἐν ἁρμονίᾳ ὑπάρχει καὶ ἐν
> τῷ οὐρανῷ καὶ ἐν πολλοῖς ἄλλοις. … 25
> κατὰ μέντοι [**C4.6**] τὸ ποιεῖν ἐξ ἀριθμῶν τὰ φυσικὰ σώματα, [**C4.7**] ἐκ 32
> μὴ ἐχόντων βάρος μηδὲ κουφότητα ἔχοντα κουφότητα καὶ
> βάρος, [**C4.8**] ἐοίκασι περὶ ἄλλου οὐρανοῦ λέγειν καὶ σωμάτων ἀλλ᾽
> οὐ τῶν αἰσθητῶν 35
>
> But the Pythagoreans, because [**C4.1**] they saw many attributes of numbers belonging to sensible bodies, [**C4.2**] made the things that are, numbers (**N2**)—[**C4.3**] not separate numbers, however, but [**C4.4**] [they made] the things that are out of (ἐκ) numbers. But why? Because [**C4.5**] the attributes of numbers are present in harmonic intervals and in the heavens and in many other things….
>
> In that [**C4.6**] they make the natural bodies out of (ἐκ) numbers, [**C4.7**] things that have lightness and weight out of things that do not have weight or lightness, [**C4.8**] they seem to be speaking of another heaven and other bodies, not of sensible ones. (tr. based on the Revised Oxford Translation, with modifications)

Like **C3** (but unlike **C1**), **C4** contains both **N1** and **N2**, and like **C1** (but unlike **C3**), **C4** gives an account of how the Pythagoreans reached the theses it contains. Accordingly, it is a potentially valuable source of information on their theory and the by now vexed question whether they really held both **N1** and **N2**, or only one (and if so, which one). **C4.1** says that they held **N2** because they saw many attributes of numbers belonging to sensible bodies, and **C4.5** that they held **N1** because the attributes of numbers are present in harmonic intervals and in the heavens and in many other things. I think that **C4.1** and **C4.5** are meant to give the same grounds, and these are in fact the grounds also mentioned in **C1.3**-**C1.5.** If I am correct, then, Aristotle is saying that the Pythagoreans inferred both **N1** and **N2** from the same considerations. This does not necessarily mean that **N1** and **N2** are synonymous or even equivalent, or that Aristotle takes them to be so. In fact as we will see, there are reasons to suppose that Aristotle considers them separate theses.

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[97] See also the discussion of **C4** below.

According to **C4.1** and **C4.2**, then, the Pythagoreans concluded that the things that are, are numbers because they saw that sensible bodies possess many attributes of numbers. Aristotle may have credited them with reasoning as follows. Numbers are the bearers of (certain?) attributes, so anything that has (any of?) those attributes has them because it (in some way) *is* those numbers. In effect, if a number has a given attribute, then anything that has that attribute is that number. But *in what way* is it that number? **C4** is part of a critical discussion of views on how numbers exist. Plato held that numbers are Forms, and therefore self-subsistent or "separate" entities (in the Aristotelian sense of existing independently and not being attributes of other entities) by participation in which sensible bodies possess attributes. Aristotle objects to this view on the grounds that Plato failed to prove that Forms exist, so the explanatory role of Forms is unjustified (1090a2–20, cf. 987b8–10, b18–19). In **C4** he says that the Pythagoreans did not hold that numbers are "separate" **C4.3**, but believed that they somehow give rise to the attributes of the things that are. Since numbers exist and are not separate from things, and also are somehow causes of the attributes of things, they concluded that things *are* numbers (**N2**). Whatever difficulties there may be for this theory, one objection that does not apply is that it cannot account for how the attributes of numbers are found in sensible bodies.[98]

But in what way are things numbers? Aristotle answers this question by saying that the Pythagoreans held that (**N2**) things are *composed of* (ἐκ) numbers **C4.4.** Perhaps the reasoning he attributes to them is that if numbers are not separate from bodies, they must be bodies of some kind themselves, either identical with the bodies to which they give attributes or components of those bodies. Since one entity can have many attributes, and since its different attributes may be due to different numbers, if a thing is simply identical with the numbers that cause its attributes, it may be identical with different numbers. But this would have the impossible consequence that those different numbers are identical with one another—a result that can be avoided by *interpreting* **N2** as **N1** and allowing a thing to be "composed of" more than one number. **C4** may display traces of this progression of thought. First we have the thesis **N2**, that the things that are, are numbers **C4.2**, which invites the question in what way things are numbers. **C4.3** states that the Pythagoreans did not adopt one possible answer to this question, the Platonic answer that numbers are "separate" entities, participation in which accounts for the properties of things. **C4.4** presents the answer Aristotle says they did adopt. It is a surprising answer, since numbers may not seem to be the right kinds of things to be components of sensible bodies. **C4.5**, then, supports this answer by repeating a familiar Pythagorean point (stated just above in **C4.1**), putting it in a slightly different way. Where **C4.1** said that attributes of numbers *belong to* (that is, are predicated of: ὑπάρχειν with dative) sensible bodies, **C4.5** says that they are *present in* (or *belong in*) (ὑπάρχειν ἐν with dative) the things that are, specifically, "in harmonic intervals and in the heavens and in many other things." It might be objected that the sensible bodies of **C4.1** are not identical with "the things that are," on the grounds that some things that are, are not sensible bodies. But shortly afterward **C4.6**, he repeats **C4.4** substituting "natural bodies" (which here is equivalent to sensible bodies) for "the things that are." Apparently, he does not here place any weight on the difference between "the things that are" and "sensible (or natural) bodies," and he doubtless took "the heavens and many other things" in **C4.5** to include the latter class of entities.

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[98] Aristotle acknowledges this much at 1090a30–31. On this score the Pythagoreans fare better than Plato and Speusippus (the latter of whom he treats briefly at 1090a25–30).

This reading of **C4** suggests that **N2** was the basic Pythagorean formulation and that **N1** is a reformulation of **N2** in a way that makes sense of that claim when the entities in question are sensible bodies. (It is hard to see how it would have been initially formulated with such things as justice, soul/mind, and "the right moment" in mind.) Is it a Pythagorean or an Aristotelian reformulation? Clearly enough, this is a question which **C4** by itself cannot answer; I shall return to it shortly.[99]

What conclusions can we draw from these passages about the Pythagorean views on which **C1** through **C4** are based? Much of the discussion is framed from the point of view of Aristotle's philosophical interests and doctrines, but it is based on what Aristotle took to be Pythagorean doctrines. The main concerns of these passages are the Pythagorean views on principles and ontology (**C1** and **C2**), and the relations between numbers and things (**C1**, **C3**, and **C4**). I shall take up the latter topic first.

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[99] Below, p. 98.

As we saw above, Aristotle recognizes three main views: that things are composed of numbers (**N1**), that things are numbers (**N2**) or number (**N3**),[100] and that things resemble or are made in the likeness of or are imitations of numbers (**N4**). **C1** is the main source for something close to **N4**; **C3** and **C4** for **N1** and **N2.**[101] **C4** infers **N1** and **N2** from the same kind of evidence that **C1** uses to infer that things are *made in the likeness of* numbers (**N4**). It is clear that Aristotle believed that the Pythagoreans based one or more of these three claims on the kind of evidence brought in **C1.4** and **C1.5.** They saw in numbers likenesses of different sorts of things and concluded … what? That things *imitate* numbers (**N4**), that things *are composed of* numbers (**N1**), or that things *are* numbers (**N2** and **N3**)? The examples in **C1.4** and **C1.5** do not suggest the second of these claims (**N1**). They suggest **N4** most directly, but there is an important difference. **C1** talks of there being likenesses of things in numbers **C1.3** and of things being made in the likeness of numbers **C1.6**, but it does not say that things *are* by imitating numbers (**N4**). This latter claim has important metaphysical implications that are entirely absent from the wording of **C1.** We can see how a Pythagorean with ontological interests might conclude **N4** on the basis of the evidence in **C1.4** and **C1.5.** Indeed, the context in which **N4** is reported strongly suggests that Aristotle had a Pythagorean source for the claim.[102] But **N2** seems an equally good possibility for what a Pythagorean might have claimed on the basis of the same evidence. **C1**, then, presents evidence, which I think it is safe to take as genuinely Pythagorean, that things are like numbers, but leaves it unclear whether **N1** and **N2** (which **C1** does not contain) are genuine Pythagorean doctrines.

Not that this is the whole story, since there is every reason to think that Aristotle knew more about Pythagorean thought than he reports in

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[100] For the identity of **N2** and **N3**, see n. 75.

[101] **C1.9** says that the whole heaven is a *harmonia* and a number, which points towards **N2.**

[102] See below, p. 102.

C1, and we have no good reason to reject **N1** or **N2** out of hand. Indeed, **C4** tells us that the Pythagoreans held both these theses and that they held them on the basis of the very evidence supplied by **C1**,[103] which means that the authenticity of **N4** is no better supported by the arguments Aristotle reports than the authenticity of **N1** and **N2.** Neither **N1** or **N2** is a rephrasing of **N4**, and it seems unlikely that Aristotle would have invented either **N1** or **N2** solely on the basis of **N4** and the evidence for it presented in **C1.** Moreover, since Aristotle takes **N1** and **N2** to be different theses that are open to different kinds of objections,[104] I think it unlikely that he would have corrupted **N1** into **N2** or vice versa. Aristotle is a hostile witness all right, but I do not think that he would be so hostile as to invent problems; he found problems enough as it was.

C3 and **C4** contain both **N1** and **N2**, but they put them in different ways. Both passages state **N2** in terms of "the things that are" (**C3.2**, **C4.2**), but **C3** states **N1** in terms of "bodies" (**C3.1**, **C3.3**) and **C4** states it both in terms of "the things that are" (**C4.4**) and in terms of "natural bodies" (**C4.6**).[105] I suggested above[106] that **N1** makes better sense as an account of the nature of sensible bodies than it does for "the things that are" in general, which for the Pythagoreans include such non-sensible entities as justice, soul/mind, and "the right moment." The evidence for the relation between numbers and things presented in **C1.4**, **C1.5** and **C4.5**, shows that they were not concerned exclusively (or even mainly, perhaps) with sensible bodies. Those like myself who think that a good deal of this evidence sounds "early" (I believe this to be the majority view) will be disinclined to think that the original formulation of the relation between numbers and things was restricted to sensible bodies, and hence will find that these considerations favor the authenticity of **N2.**

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[103] **C4** seems to repeat much of **C1**, but there are significant differences. **C1** speaks of things *resembling* numbers (**N4**), while **C4** speaks of things *being* numbers (**N2**) and *being made from* (ἐκ) numbers (**N1**). Also, where **C1** says that such and such an attribute of numbers is justice, etc., **C4** says that attributes of numbers belong to sensible bodies. Note that neither justice nor the other examples given in **C1** are sensible bodies, and further that **C1** says that the Pythagoreans saw the attributes and ratios of the harmonic intervals in numbers, while **C4** says, vice versa, that the attributes of *numbers* are in *them*.

[104] For an objection to **N1**, see *Metaph*. 1090a32–5 (= **C4.6**-**C4.8**) where Aristotle complains that the Pythagoreans "make the natural bodies out of numbers." For **N2**, see *Metaph*. 1090a12 ff., where Aristotle objects that unlike the things in the cosmos, numbers are eternal and unchangeable, and *Metaph*. 987a22–27 (= **C2.6**-**C2.9**) which points out that it follows for the Pythagoreans that if things are identical with numbers, then one thing will be many.

[105] Also compare **C4.1** "they saw many attributes of numbers belonging to sensible bodies" with **C1.3** "in these [viz. numbers] they thought they observed many likenesses to the things that are and that come to be."

[106] p. 95.

What, then, of **N1?** If it is not Aristotle's erroneous restatement of **N2**, is it genuine too? Would the Pythagoreans have asserted two such similar (and yet such different) claims as **N1** and **N2?** I believe they asserted both theses, and that **N1** is in effect a Pythagorean reformulation of **N2** in a way that makes it more applicable to sensible bodies—a particular kind of "things that are." Aristotle takes them to hold that sensible bodies are numbers in that they are constituted of them in the same way that a chair is wood and nails and a man is flesh and blood. It is certain that the ἐκ locution was Pythagorean: Philolaus uses it in **B1**, **B2**, and **B6**, so Aristotle could have taken this formulation from a Pythagorean source. This way of expressing the relation between things and numbers may explain Aristotle's insistence that the Pythagoreans must have been thinking of material causes.[107] Possibly this is behind the move from "principles" in **C1.1** to "elements" in **C1.8**, since Aristotle frequently uses στοιχεῖον in connection with *material* elements.[108]

However, it would be unwise to leave the matter at this point, since Huffman has rejected both **N1** and **N2** as due to an Aristotelian misinterpretation of Philolaus.[109] To be sure, these theses are not found in Philolaus's extant fragments. In fact, **N1**, which declares that things are ἐκ numbers, is incompatible with **B1**'s claim that they are ἐκ unlimiteds and limiters. Huffman proposes that **N1** and **N2** (he does not clearly distinguish between the claims) are Aristotle's ways of summarizing Pythagorean (i. e., Philolaus's) doctrine.[110] The doctrine in question is Philolaus's cosmology, including specifically the stage discussed in **B7**

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[107] See **C1.11** and 986b6–8: "They seem to range the elements under the head of matter, for they say substance is constituted and fashioned out of these and that these are present in it" (adapted from the Revised Oxford Translation).

[108] See n. 77.

[109] See n. 42. "It is an Aristotelian interpretation of Philolaus"; Huffman (above, n. 3) 63. But this is too confident. Earlier in the same paragraph Huffman says more cautiously (and, I believe, correctly), "It seems most likely that he [Aristotle] had Philolaus's book *and perhaps some other writing or oral reports*." Huffman gives no reason for eliminating or ignoring the second and third possibilities.

[110] Huffman (above, n. 3) 63.

("The first thing that was joined, the one in the middle of the sphere, is called the hearth"), which Huffman argues Aristotle mistakenly interpreted as the first stage in the generation of the number series, whereas in fact it is an early stage in the generation of the cosmos. Huffman's argument is strong but I am not convinced that it overturns Burkert's view that the Pythagoreans (or Philolaus) viewed the generation of the cosmos as identical with the generation of the number series,[111] so that what **B7** describes is both the first stage in the generation of the number series and an early stage in the generation of the cosmos.

Huffman's other piece of evidence that Aristotle did not find **N1** in any Pythagorean text is also plausible but not decisive. It is *Metaphysics* 1083b17–19 (= **C3.2-C3.3**), which he paraphrases and translates as follows: "Aristotle first states flatly that the Pythagoreans say that all things are numbers, but then continues in the next sentence 'at least (γοῦν) they apply θεωρήματα to bodies as if they (the bodies) consisted of those numbers.'" As Huffman understands the passage, "the crucial point is that the doctrine that all things are numbers is not presented as something that the Pythagoreans explicitly stated, rather it is presented as Aristotle's own *deduction* from the way the Pythagoreans proceed."[112] While this is a legitimate way to construe Aristotle's words, it is not the only way. On another way of understanding the particle γοῦν, the sentence is translated "They say that the things that are, are number. In fact they apply their propositions to bodies supposing that they consisted of those numbers." I defended this reading above.[113] If the sentence is taken this way, then far from showing that **N1** and **N2** are Aristotle's conjectures, it is actually evidence that his Pythagorean sources, whatever they were, contained both **N1** and **N2.**

As to the views on principles contained in **C1** and **C2** (especially **C1.12-C1.13** and **C2.1-C2.4**), all that remains to do is see whether the doctrines of the two passages (treated above, pp. 89–90) can be made into a coherent account, and if so, whether it is likely to be based on a Pythagorean source.

I support an affirmative answer to the first of these questions.[114] Aristotle presents a Pythagorean ontology with several levels. **C1.12** makes the even and the odd (which are somehow related to the unlimited and the limited; either they are identical or the latter pair are the principles of the former) ultimate principles. They are the immediate principles of "the one"; "the one" is the immediate principle of number. **C1.13** completes the ontology by giving a hint that numbers[115] are the principles of the sensible world. The notion of principle involved here is expressed by the ἐκ locution; we are dealing with something that Aristotle thinks approximates to his notion of the material cause.

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[111] For references, see n. 41.

[112] Huffman (above, n. 3) 60–1.

[113] See pp. 92–3.

[114] I take up the second question below in Section 8.

C2.1 clears up the relation between the pairs even/odd and unlimited/limited. **C2.1** states that there is one pair of ultimate principles, and **C2.2** makes it clear that this pair consists of the unlimited and the limited; not anything else such as fire or earth (or, we may add, even) that is unlimited, but **C2.3** the unlimited *itself.* **C2.4** says more clearly than **C1.13** that number is the substance (again, presumably, in the sense of the material cause) of "all things," which must mean everything with the exception of the entities that are higher up in the ontology: the unlimited and the limited, the even and the odd, "the one," and number.

There remains the question deferred from above (p. 72): what is the significance of the change from talk of the unlimited and the limited in **C2.2** to talk of the unlimited and "the one" in **C2.3?** It is clear that in **C2.2** Aristotle is dealing with the ultimate principles. In **C2.3**, I think, he is dealing with "the one" as a principle of number and is alluding to something not made explicit in **C1.12**, that "the one" is not the only principle on which numbers depend; they depend on the unlimited as well. The most useful text on this subject is *Metaphysics* 1091a15–18 (quoted above as evidence for **N12**), which talks of generation[116] subsequent to the generation of "the one." Most scholars think that this passage refers to the generation of numbers. First "the one" was generated and then in some obscure way, the unlimited was "drawn in" (presumably by the action of "the one" on it) to form the other numbers.[117] If this is right, then the unlimited is (along with the limited) a principle of "the one" and (together with "the one") a principle of the other numbers.

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[115] I note the change from "number" in **C1.12** to "numbers" in **C1.13**, but I do not see that any difference is intended. See n. 75.

[116] I use "generation" for want of a better term. I take it that what is being described is not a process of generation in time, but of ontological dependence.

[117] Even if Huffman is correct in thinking that **N12** refers to the generation of the cosmos (above, p. 72), it seems likely that some analogous procedure (possibly even the same series of events) could have been used to account for the "generation" of numbers. See n. 41.

The resulting ontology has five tiers.

1. The unlimited itself and the limited itself—which are, respectively, principles of:
2. The even and the odd—which are jointly principles of:
3. "The one"—which (jointly with the unlimited) is a principle of:
4. Numbers (number)—which in various ways are principles of:
5. Everything else ("all things")

8. What did Aristotle's Sources Tell him about Pythagorean Principles?

I now return to the list of Aristotle's reports on Pythagorean principles (**N1**-**N13**). The problem is how to sort them out—which are authentic Pythagorean views and which are Aristotelian rephrasings and interpretations? And of the authentic views, which ones are likely to represent Philolaus's theory? Whereas the list was composed of statements taken out of context, in Section 7 I provided the contexts in which most of them occur and discussed their meaning in context. Much of the following discussion is based on the results of that section.

I argued above that **N1** and **N2** are both authentic Pythagorean views.[118] Are they due to Philolaus? As for **N1**, it is true that Philolaus uses the ἐκ locution in stating the relation between his principles and the entities of which they are principles (**B1**, **B2**, **B6**). However, the claim that things are ἐκ numbers corresponds to nothing in his preserved fragments, and it actually conflicts with **B1.**[119] Further I find it hard to believe that Aristotle would have corrupted **B1** into **N1.** As for **N2**, there is nothing in Philolaus's fragments that remotely resembles the claim. **N1** and **N2** must be regarded as not based on Philolaus.

As I said above, I take **N3** to be equivalent to **N2.**[120] Whether Aristotle's Pythagorean sources spoke of "number" as well as "numbers" I am not willing to say. Nothing in Philolaus's fragments corresponds to **N3**.

N4 assembles Aristotle's statements that the Pythagoreans held that (a) things have likenesses to numbers, (b) they have the same attributes as numbers, (c) they are made in the likeness of numbers, and (d) they are by imitation of numbers.[121] At least some ingredients of **N4** are very likely to be authentic. I accept (a) and (b) as genuinely Pythagorean in spirit and the examples which Aristotle gives in support of them as genuinely Pythagorean, even though the wording of the generalizations involved ("In numbers they supposed that they observed many likenesses …" and "They saw the attributes …") is obviously Aristotle's. (c) is a stronger claim than (a) or (b) in that it makes numbers in some sense the model or prototype of things.[122] It would not be surprising if the Pythagoreans actually held (c) on the basis of the observations that grounded their claims (a) and (b).[123]

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[118] See above, pp. 95–9.

[119] See p. 98.

[120] See n. 75.

As for (d), Aristotle introduces it in the course of his comparison of Pythagorean views with Plato's. He says that where the former group said that things are by imitation (μίμησις) of numbers Plato said that things are by participation (μέθεξις) in the Forms. The relation is the same; Plato just changed the name. Plato does in fact use the word μέθεξις and the related verb μετέχειν of the relation between sensibles and Forms. And since Aristotle here is making a point not only about the doctrines of Plato and the Pythagoreans but also about their terminology, I suppose that Aristotle had a good reason to attribute the word μίμησις to the Pythagoreans.[124] On the other hand, even though it uses the Pythagorean term "imitation," the statement that things "are" or "exist" by imitation of numbers may not be authentic It has a Platonic ring[125] which is perhaps out of place in a fifth-century context and may be due to Aristotle's phrasing the point he is making in a way that makes clear the parallel between the Platonic use of "participation" and the Pythagorean use of "imitation." Alternately, this very expression may have occurred in a Pythagorean context of the generation contemporary with Plato. In any case, there is nothing in Philolaus that corresponds with any of the four claims (a) through (d).

The temptation to see **N5** as Aristotle's attempt to express Pythagorean ideas in the terminology of his own philosophy (ἀρχή in the sense of "principle"), and therefore unauthentic, would be irresistible if the word did not occur in a similar context in Philolaus **B6** ("The ἀρχαί are not similar or of the same kind"). Philolaus's ἀρχαί are the limiters and the unlimiteds, which are undoubtedly principles in some sense. Indeed since Philolaus may offer a two-tier ontology,[126] with limiters and unlimiteds as the principles of everything else (presumably including numbers[127]), **N5** may refer to Philolaus's system and may even derive from Philolaus.

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[121] For (a), *Metaph.* 985b27–31 = **C1.3-C1.4**; for (b), ibid. 985b31–2 = **C1.5**; for (c), ib. 985b32–3 = **C1.6**; for (d), ibid. 987b11–12.

[122] See discussion of **C1.6**, p. 82.

[123] See below, p. 116.

[124] "Evidently Aristotle knew the Pythagoreans had used the word μίμησις" Burkert (above, n. 2) 44.

[125] Cf. Plato, *Soph.* 259a7.

N6 repeats **N5** almost literally, with two exceptions. First, it substitutes στοιχεῖα ("elements") for ἀρχαί ("principles"), which I take to be an Aristotelian paraphrase, intended to bring out Aristotle's view of the way in which the Pythagoreans made numbers their material cause.[128] Second, it substitutes "numbers" for "these," where the latter refers not yet specifically to numbers but to mathematical entities. **N5** and **N6** are each stated in only once, in fact, in the same context, passage **C1.** I view **N6** (whose sole source is **C1.8**) as simply an Aristotelian restatement of **N5** (whose sole source is **C1.1**).[129]

N7, however, which is witnessed only by **C1.11**, is heavily laden with distinctively Aristotelian terminology ("matter," ὕλη; "attribute," πάθος; "state," ἕξις). The passage presents problems which I discussed above,[130] where I concluded that the claim that number is a principle as matter is based on a Pythagorean source because it probably employed the ἐκ locution, and the claim that it is a principle as attributes and states is also an Aristotelian interpretation of Pythagorean views. If it is an accurate (albeit Aristotelian) description of Pythagorean ideas, those ideas are not found in Philolaus's extant fragments.

Whereas **N1** through **N7** mainly have to do with the importance of numbers, **N8** through **N11** are chiefly concerned with ultimate principles and the relations between principles and the things whose principles they are.

N8 (= **C2.1-C2.4**) contains five claims. First, **C2.1** it states that the Pythagoreans posited two principles; second **C2.2** it identifies the principles as limit and unlimited. There is no difficulty in seeing Philolaus's limiters and unlimiteds at the root of this claim and we can therefore take it at the very least as a close paraphrase of an authentic Pythagorean view, even of Philolaus. It may also be the case that a different Pythagorean source actually called the principles limit and unlimited.

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[126] See, however, n. 38.

[127] On the traditional interpretation, **B7** describes the generation of the number one, and thus begins the generation of the number series. However, Huffman has challenged this interpretation, arguing that **B7** concerns the first stage in Philolaus's cosmology. See discussion above, pp. 85–8.

[128] See discussion of this point above, p. 57.

[129] See p. 80.

[130] pp. 85–8.

Third, **C2.3** refers to "the unlimited itself" and "the one" as principles. On the interpretation proposed above (p. 100), they are not *first* principles, but principles specifically of numbers. Alternatively, Aristotle could be carelessly using "the one" as equivalent to "the limited." In any case this is un-Philolaic.

The fourth claim in **N8**, **C2.3**), that the unlimited and "the one" are the οὐσία of the things of which they are predicated, sounds like Aristotle interpreting Pythagorean doctrine in the vocabulary of his own system, possibly under the influence of his occasional assimilation of Pythagorean doctrines to Platonic views.[131] It is a well chosen word, since it has a range of meanings that conveniently includes "essence" and "substance." I say conveniently because **N9** (**C2.6**) reports that the Pythagoreans regarded the number two to be the οὐσία of double and does so in a context where it is clear that οὐσία means essence (987a26 = **C2.7**), while according to **N1** and **N7** numbers are taken to be the material cause or matter of things, and hence are in this way the substance of things.

The word οὐσία does not have a good pedigree in early Pythagorean texts. (It is found twice in Philolaus **B11**, a fragment that is judged spurious.) On the other hand, Philolaus uses the related word ἐστώ (which I translate "being") twice in **B6.** The interpretation of **B6** is uncertain. As I interpret the fragment, ἐστώ means "being" in an undifferentiated sense, which has different applications in different contexts. In this I think that it corresponds to Aristotle's οὐσία, which (*inter alia*) sometimes refers to a thing's matter and sometimes to its essence,[132] as I noted above. In the context of **B6** I believe that the word could be taken in either of the two ways. Certainly if Aristotle knew the text, it would be natural for him to paraphrase it in terms of οὐσία and to interpret it in whatever sense of οὐσία seemed appropriate.

In **B6**, where Philolaus speaks of "the ἐστώ of things" and "the ἐστώ of the things from which the cosmos is constituted," I think that he is talking about the ἐστώ of different groups of "things." "The things out of which the cosmos is constituted," designates the principles—the limiters and unlimiteds; in the phrase "groups of things," "things" designates "things" in general, which include not only the principles but also "the things that are and are known by us"—the objects we know in the world around us, which **B1** tells us were joined from the principles.[133] If I am correct, then the first part of **B6** tells us that the ἐστώ of things, including both the principles and the derivative things that come to be in the world around us, is eternal, and that we cannot know the ἐστώ of any of these things; the only thing about their ἐστώ and nature that we can know is that none of the things that we know (that is, none of the things in the world around us) could have come to be if the ἐστώ of the limiters and unlimiteds out of which the world is constituted did not exist. This claim makes sense if we take ἐστώ to refer to material constituents. Philolaus is then saying that we cannot know the nature of the material constituents of the principles. So even if we know that derivative entities are composed of the principles, we cannot know what their (ultimate) material constituents are either. This reading of **B6** allows us to approach the fourth claim of **N8**, that the Pythagoreans believed that the principles (viz. the unlimited and "the one") are the οὐσία of the things of which they are predicated.

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[131] See Huffman (above, n. 3) 207.

[132] Burkert's discussion is instructive (above, n. 2) 255–7. He argues that ἐστώ in Philolaus is not to be understood as a material principle, but that "in ps-Archytas p. 19.19 Thesleff, ὠσία/ἐστώ is certainly the Aristotelian material principle."

Two features of this statement need explaining: first, the un-Aristotelian claim that the principles are predicated of derivative entities and second the potentially ambiguous claim that the principles are the οὐσία of those entities. Regarding the first, **B2** entitles us to think that Philolaus would agree that the principles are predicated of the entities derived from them, since it announces that the things "that are from limiters limit, those that are from both limiters and unlimiteds both limit and do not limit, and those that are from unlimiteds will evidently be unlimited." Regarding the second, Aristotle's claims in **N8** that make use of his own equivalent term, οὐσία, fall into line (to an extent) on the interpretation that in **B6** ἐστώ refers to the material constituents of things. For as I suggested above, Aristotle was sometimes inclined to view Pythagorean principles as the material causes of the derivative entities (cf. **N1**, **N7**), particularly when the derivative entities are physical bodies. And so the assertion in **N8** that the unlimited and "the one," here identified as principles, are the οὐσία of the things whose principles they are, is easy to understand if we take οὐσία to refer to the matter of the derivative entities.

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[133] This interpretation is controversial. Huffman (above, n. 3) 130 thinks that it applies only to the principles, since he supposes that ἐστώ means being in a "fused" existential-cum-essential sense, and since **B6** says that the ἐστώ of things is eternal. The things in the world around us are not eternal, so they do not qualify for having an eternal existential being. But I do not find the argument for the fused sense compelling. The fact that the ἐστώ is said to ὑπάρχειν does not tell any more in favor than against the view that ἐστώ all by itself includes the notion of existence; if it included that notion, why bother to make the assertion?

But the fit with **B6** is not exact, since in **N8** the principles themselves are said to be the οὐσία of the derivative things and **B6** identifies neither the principles nor their ἐστώ with the derivative things or *their* ἐστώ. If, then, this part of **N8** is based on a misreading of **B6**, it represents that fragment very inaccurately. Alternatively, if we suppose that it is not an unsuccessful attempt to report the doctrine of that fragment, it may well be influenced by some of Philolaus's ideas even so. It is also possible that Aristotle's statement is based on some other Pythagorean source that says clearly that principles are the being of derivative entities.

I pointed out in discussing **C2**[134] that the fifth and final claim in **N8**, "this is why they call number the οὐσία of all things" **C2.4**, does not follow from **C2.3**, but makes sense in view of the entire ontology Aristotle sketches if we understand it as applying at a lower level. What needs explaining is the connecting phrase "this is why." I think that Aristotle means that number is the principle of the things below it in the ontology in the same way as the unlimited and "the one" are principles of the things just below *them*. Since the latter pair are principles of those things in that they are their οὐσία, "this is why" number is the οὐσία of "all things" (where "all things" refers to all things not already included in the higher levels of the ontology[135]).

The claim that number is the οὐσία of all things does not fit with what we know of Philolaus. While it might rely on some lost Pythagorean source, it could also be another way of putting the idea of **N1** or **N2**: **N1** if οὐσία is taken to mean "substance" with an emphasis on its material aspect, and **N2** if it is taken to mean "essence."

I said something about **N9** above.[136] The only text that witnesses it uses οὐσία in the sense of essence and seems to be an Aristotelian analysis of Pythagorean claims of the form that some feature of the world (such as "double") is (in the sense of "is essentially") some number (such as two). Alexander gives some other examples: justice is the first number that is equal-times-equal (i. e., four); "the right moment" is the number seven; marriage is the number five, etc.[137] There is nothing in Philolaus's fragments like these examples or the thesis that they illustrate.

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[134] pp. 89–90.
[135] See p. 100.
[136] p. 91.

An important point to bear in mind about **N10** is that the single passage that attests it is not taken from Aristotle's discussion of the Pythagoreans in *Metaphysics* A5, but is part of his treatment of Plato's philosophy in *Metaphysics* A6. It is part of a complex passage recently explicated by Huffman,[138] in which Aristotle speaks of Plato's relations to earlier philosophers, including the Pythagoreans. In particular, he says that Plato used the word "participation" (μέθεξις) to express the relation that the Pythagoreans expressed with the word "imitation" (μίμησις) (987b9–14, cf. **N4**), that like the Pythagoreans he had views on the nature of mathematical entities, and that his views on this topic were like those of the Pythagoreans in some ways and unlike them in others (987b14–988a1). The subject of the sentence that witnesses **N10** is not "the Pythagoreans," but "Plato," understood from earlier in the paragraph. The discussion is directed more at Plato than at the Pythagoreans and its vocabulary is more Aristotelian and Platonic than Pythagorean. The passage, then, does not pretend to be closely based on any Pythagorean source and can be expected to distort Pythagorean ideas in order to make them comparable to Platonic theses.[139]

N10's first claim, that "the one" is οὐσία, can be interpreted in several ways. (a) "the one" *is* οὐσία; (b) "the one" is *an* οὐσία; (c) "the one" is the οὐσία of all other things (where "of all other things" is understood from 987b24 just below). The context shows that (c) is what is meant; the previous sentence (987b18–21), which speaks of the Platonic views that the Forms are causes of other things and that the elements of the Forms are the elements of all things, also declares that Plato made the great and the small principles as matter and he made "the one" principle as οὐσία, which is best interpreted here as "form" in the Aristotelian sense, or "essence." It is reasonable, then, to take **N10** closely with **N8**, which regards "the one" as a principle and declares the principles, namely the unlimited and "the one," to be the οὐσία of the things of which they are predicated and number to be the οὐσία of all things.

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[137] Alexander, *in Metaph.* 38,10, quoted p. 81.

[138] Huffman, "Plato's disagreements with the Pythagoreans: A response to Brisson and Kahn," delivered at the Pacific Division meeting of the American Philosophical Association, 2005.

[139] For a likely instance of such a distortion, see above, p. 102.

The second claim of **N10**, that numbers are the causes of the οὐσία of all other things shifts from talking about "the one" to talking about numbers. (Cf. the change between the fourth and the fifth claims in **N8.**). Where the fifth claim in **N8** asserts that number is the οὐσία of all things, **N10** says that numbers[140] are the causes of the οὐσία of the other things.[141] This is a different thesis from anything we have seen before, in particular from the claims that things are numbers (**N2**, **N3**) and that numbers are the substance, matter, or essence of things (**N1**, **N7**, **N8**, **N9**). While nothing precludes some Pythagoreans from having made this rather careful claim, it sounds to me more like an attempt on Aristotle's part to make sense of such Pythagorean doctrines as the ones reflected in **N1** and **N2**, which were, from Aristotle's point of view, sheer and utter nonsense. It is hard to find anything in Philolaus very close to the doctrines put forward in **N10.**

N11 and **N12** must, I think, have authentic Pythagorean pedigrees even though the passages that cite them they may contain some Aristotelian terminology. They are too specific and detailed for Aristotle to have made them up or to have taken them to be the meanings of less definite claims. The most striking thing about these two texts is how different they are from one another. **N11** seems to offer a kind of analysis of things into their constituents: number is composed of "the one," "the one" is composed of the even and the odd. It may even hint at an argument: the elements of number are the even and the odd because "the one" is composed of them and number is composed of "the one." On the other hand, **N12** seems to describe the generation of the number series by the operation of "the one" on the unlimited.

Even on Huffman's alternative interpretation of **N12** as an account of the first stage of a cosmogony, an account of the stages by which the cosmos came to be over a period of time,[142] the accounts in **N11** and **N12** need not be incompatible, any more than a respectable cosmogony today need be incompatible with current understanding of the physical and chemical constituents of things in the universe. A cosmogony gives a different kind of account of the universe than physics and chemistry do, just as **N11** gives a different kind of account from **N12.** The fact that we have different kinds of accounts does not prove that they came from different sources. In fact, both have links with Philolaus. **N12** could well stem from the cosmology of which **B7** and **B17** are the only surviving fragments, as long as we understand "the one" in **N12** to be the same as "the one in the middle of the sphere," which **B7** calls the hearth (that is, the central hearth of the cosmos), as Huffman proposes.[143]

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[140] As elsewhere, I do not think that Aristotle intends any difference between "number" and "numbers"; cf. n. 75.

[141] Actually, the word translated "causes" in the standard English translations of the *Metaphysics* is an adjective, not a noun: αἰτίους (modifying ἀρίθμους), not αἰτία or αἴτιον. Numbers are "responsible" for the οὐσία of things. The idea is that if you want to find the οὐσία of something, look to the relevant numbers.

[142] See above, p. 72.

N11 has links to Philolaus's general account of limiters and limiteds as principles, if we assume that he admits principles of numbers. However, the parenthetical remark that the even is unlimited and the odd is limited may conceal a further step in this analytic account (allowing for the slippage that is inevitable since Aristotle does not speak of limiters and limiteds). In the terminology of **B2**, the odd is "from limiters" and the even is "from unlimiteds." "The one" is "from" the even and the odd: "from both mixed together," as **B5** tells us: it is an even-odd number. And the remaining numbers are "from" "the one." The resulting ontology is incompatible with the ontology presented in Philolaus **B1**,[144] but could be based on a different Pythagorean source.

N13 is presented as a belief held by "others" that fall in the range of the Pythagorean umbrella. I have used it already as a piece of evidence that Aristotle used more than one source.[145] It is surely genuine: again, it is inconceivable that Aristotle made it up. Also, it conflicts with Philolaus's doctrine that limiters and unlimiteds are two kinds of principles, not one. To be sure in the parallel columns limit and unlimited come first (counting them as one principle, not two), but the nine remaining oppositions are not derived from that primary pair; there are ten principles not two (or twenty).

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[143] Huffman (above, n. 3) 202 ff.

[144] See above, p. 71–2.

[145] Above, p. 58–9.

9. A Developmental Sketch of Pythagorean Thought on Numbers and Principles

It is clear that the claims attributed to the Pythagoreans in **N1**-**N13** are not all consistent.[146] Some of the inconsistencies can be accounted for as stemming from Aristotle's difficulties in making sense of their views, and others as being due to his attempts to state them in his own philosophical language. But major inconsistencies remain. Accepting the claims of **N1**-**N13** as based on genuine Pythagorean doctrines requires us to posit a plurality of sources, or at least a single source that is itself based on a plurality of others. But rather than resting content with simply saying that the Pythagoreans were an inconsistent lot, I believe that much of the inconsistency in Aristotle's reports can be explained through suitable reconstruction of the development over time of Pythagorean thought on the subject of numbers and principles. In what follows I propose such an account, which is drawn entirely from the passages from Aristotle discussed earlier in this paper. It is important to admit at the outset that Aristotle does not distinguish between earlier and later Pythagorean views. What I offer is meant to be no more than an outline of a *possible* history of their thought on these subjects.[147] As I see it, Aristotle's remarks reflect three stages, as follows.

Stage 1: Observation of resemblances between things and numbers.
Stage 2: Identification of numbers as the principles of things.
Stage 3: Identification of the principles of numbers, which are also the principles of everything else.

The Pythagoreans (Pythagoras himself by many accounts) were (Stage 1) struck by the numerical basis of the harmonic intervals and they found (or "supposed that they observed") numerical properties in other sensible phenomena as well.

They then[148] (Stage 2) arrived at the view that numbers were basic, that in some way everything was dependent on them, a view they may have expressed in a variety of ways, such as "the things that are are composed of numbers" (**N1**) and "the things that are, are number(s)" (**N2**–**N3**) or "the things that are, are by imitation of numbers" (**N4**). **N7** and the first part of **N10** represent this stage, even if it is an Aristotelian reformulation as suggested above. Characteristic of Stage 2 is the identification of justice with the number four and the other identifications mentioned in **N4.**

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[146] I identified some inconsistencies above, pp. 65–6.

[147] See Burkert (above, n. 2) 30. Burkert is skeptical of attempts like the present one to discern a historical development of Pythagorean thought.

[148] I do not insist that Stage 2 followed Stage 1 chronologically. It is possible that the discovery that things are like numbers in certain ways was *expressed* in the claims that all things are numbers, or are composed of numbers. Still, it is obvious that there is an important conceptual and theoretical difference between

Finally (Stage 3), they turned their interest in principles to number itself and developed views on what the principles of numbers are. Thus **N5** and **N6** speak of the principles and elements of numbers and assert that *they* (rather than numbers themselves) are the principles of all the things that are, and **N11** identifies the even and the odd as the elements of numbers, and provides information about the derivatijon of numbers from those principles. The derivation of numbers is also I think[149] the topic of **N12. N10** is also relevant to this stage, though I think it also reflects interests characteristic of Stage 2.

The interest in principles prevailed to the extent that numbers lost their central role. The principles were identified as limit and the unlimited (by Philolaus, as limiters and unlimiteds), and interest may have shifted to accounting for things in terms of those principles rather than doing so through numbers, which are themselves generated from the same principles. The principles are said to be the οὐσία (or ἐστώ) of the things that are dependent on them. This is the situation of **N8** and **N9**, and perhaps the doctrine of parallel columns cited in **N13.** It is also the situation of Philolaus.

All three stages are reflected in Aristotle's testimony. He gives a prominent position to the second stage, which struck him as importantly different from the other early theories that he summarizes, and which has connections with the topics of definition and essence, topics important for Aristotle, especially in the *Metaphysics*. He does not claim that there is a single Pythagorean orthodoxy, so he is not to be blamed if he reports conflicting views in different places. Recall the passages cited above in Section 2 that show him reporting that a particular view was held by "some" of the Pythagoreans or by "others." Even so, and despite the differences he acknowledges, he evidently thought that "the Pythagoreans" or "those called Pythagoreans" had enough

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saying that one thing is *like* another and that one thing *is* another, even if the former claim is the basis for the latter one.

[149] For Huffman's disagreement, see p. 72.

in common to be given a common label and treated together. The developmental sketch I have presented justifies this practice, since there are close links among the three stages and all of them are stages in a single tradition of thought.

On this picture Philolaus belongs to the most advanced stage, as we would expect from his chronological position, born over a century after Pythagoras. A question that arises at this point is whether Philolaus's ideas or at least his more general and sophisticated approach were generally shared by the Pythagoreans of his generation and later, and here I cannot say. Eurytus seems not have shared it; his trick of identifying things with the number of pebbles needed to fill in their outlines seems hardly worthy even of Stage 1. I wonder, then, whether Philolaus was an outlier in the early Pythagorean tradition, advancing earlier thought in a philosophically important way, but in a way that was not pursued by his Pythagorean colleagues. I have not found evidence that can decide this issue. But if it makes sense to talk about a history of Pythagorean thinking about numbers and principles, this will be an important topic to pursue.

10. Aristotle's Frustrations with Pythagorean Thought

Aristotle says several times that the Pythagoreans (or *some* Pythagoreans) made or constituted the heaven, or bodies, or natural bodies, or nature, or the things that are out of numbers (**N1**). In his own system, this view amounts to a claim that numbers are the material cause of things—which Aristotle finds obviously false. He also says that they said that things (τὰ ὄντα, πράγματα) are numbers—which he finds equally false. Armed with his distinctions between subject and predicate, between substance and attribute, between essence and accident, and in particular in the light of his view that numbers are attributes, not substances, he cannot but regard these Pythagorean claims and most of the other claims listed above (**N1**-**N13**) as arrant nonsense. No one sharing these views of Aristotle would think of claiming that numbers are the principles of things, let alone that things (including physical objects and other substances) are identical with numbers or made up of numbers. On the other hand, the Pythagoreans put these ideas forward, which suggests that they did not hold the Aristotelian views with which they conflict.

In this last section of my paper I will propose an explanation why the Pythagoreans put forward these views. I will not proceed by looking for a view of reality that substitutes number for substance as the basic kind of entity and perhaps turns other Aristotelian doctrines upside-down as well, for I do not suppose that the fifth-century Pythagoreans had any developed ideas in these directions, any more than anyone else did before Plato did and Aristotle after him. Instead I will take up some threads of the Aristotelian evidence that I have not emphasized until now, and try to make the case that the general approach of the early (Stage 1 and Stage 2) Pythagoreans to these issues was quite different from Aristotle's, and resembled ways of thinking noticeable in Heraclitus, who may have been contemporary with this period of Pythagorean development.

Much of the first part of passage **C1** (**C1.1-C1.10**) describes Stage 1, with the exception of the introductory material (**C1.1** – **C1.2**), **C1.8** (in which the interest in the elements of number is appropriate to Stage 3), and **C1.9** (which is characteristic of Stage 2). The remaining material in **C1** does not suggest either that the people who were enthusiastically noticing that things resembled numbers in various ways had even reached the point of declaring that things are made of numbers or are identical with number, the theses characteristic of Stage 2. In fact the Stage 1 Pythagoreans were onto the important idea that many important features of things and their behavior and their relations can be described numerically. According to the Aristotelian passage this valuable discovery may have prompted a program of research: to identify the numerical relations that things actually have.

Aristotle does not object to the discovery of the numerical attributes and ratios of harmonic intervals. Recall that he says that they *saw* these things, not that they just *supposed* that they observed them; this was a genuine discovery, not a fancy.[150]

This is a long way from justifying the grand claims for number that characterize Stage 2. Or so it appears to us, and so it did to Aristotle, who directs his serious criticism at claims that reflect that stage. But it may not have been so far for the early Pythagoreans. It seems to have been characteristic of early presocratic thought to make sweeping pronouncements on the basis of what we would consider grossly inadequate evidence. Consider Aristotle's statement about Thales' basis for claiming that water is the material principle.

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[150] See above, **C1.5.**

> He may have got this idea from seeing that the nourishment of all things is moist, and that even the hot itself comes to be from this and lives on this … and also because the seeds of all things have a moist nature and water is the principle of the nature of moist things. (*Metaph.* 983b22–27)

Whether or not these were the grounds for Thales' sweeping pronouncement about the primacy of water, the fact that Aristotle thinks they may have been says something about the kind of evidence he thought the early natural philosophers used and the way they used it. Closer to our time period is Heraclitus, who held that all things are one.

Heraclitus's fragments associate several of his key concepts.[151] For example, he identifies the cosmos with fire and asserts that fire is ever-living:

> The cosmos, the same for all, none of the gods nor of humans has made, but it was always and is and shall be: an ever-living fire being kindled in measures and being extinguished in measures. (DK 22 B30)

He gives fire in its purest and most highly active form a controlling role in the cosmos:

> Thunderbolt steers all things. (DK 22 B64)

In the individual, the soul, which makes us alive and directs us, is fiery: "fire" and "soul" are used interchangeably in DK 22 B36 and DK 22 B31:

> It is death to souls to come to be water, death to water to come to be earth, but from earth water comes to be and from water soul. (DK 22 B36)
>
> The turnings of fire: first, sea; and of sea, half is earth and half fiery waterspout…. Earth is poured out as sea, and is measured according to the same *logos* it was before it became earth. (DK 22 B31)

Further, fire as the all-controller seems to be identified with the *logos*, according to which all things come to be:

> … For although all things come to be in accordance with this *logos*… (DK 22 B1)

The active nature of the universe is war and strife, which Heraclitus declares is justice. Further strife and necessity are assigned the all-controlling role that also belongs to fire and the *logos*.

> War is the father of all and king of all … (DK 22 B53)

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[151] The following translations and discussion are taken from R. McKirahan, *Philosophy before Socrates*^{2} (Indianapolis 2011) 135–6.

> It is necessary to know that war is common and justice is strife and that all things happen in accordance with strife and necessity. (DK 22 B80)

Events in the cosmos, including transformations of one substance into another and changes between opposites, are a necessary and universal war and struggle which is needed to maintain the cosmos in a stable condition. Whatever results in a particular case, it is part of the overall process that rules the universe with justice. Heraclitus identifies the justice and therefore the strife and war in the universe with fire:

> For fire will advance and judge and convict all things. (DK 22 B66)

Fire is also associated with God:

> God is day and night, winter and summer, war and peace, satiety and hunger, but changes the way fire, when mingled with perfumes, is named according to the scent of each. (DK 22 B67)

Both fire and God take on different appearances in different situations, but keep their own nature. In a sense, fire is the one behind the many, the unity in all the diversity of the cosmos. Law too may form part of the same cluster of concepts:

> It is law, too, to obey the counsel of one. (DK 22 B33)

Heraclitus thus associates the *logos*, fire, soul, war, justice, God, and perhaps law. In some sense they are the same, the ruling element in the universe, but precisely how they are the same is not clear. For example, when I strike a match and create some fire, I am obviously not bringing the eternal *logos* or God into being. It will not do to demand strict conditions of identity in this context any more than it does when Heraclitus says that day and night are one (DK 22 B57). In different settings these concepts take on a variety of relations to one another, sometimes being virtually identical and sometimes being almost separate. For example, the burning match is not God, but is related to the cosmic fire (as a part? by likeness? as an imperfect specimen? as a copy?) and in its small area of active existence it performs functions which both symbolize and are a part of the war and justice that rule the world. Heraclitus lacked conceptual tools and analytical techniques for analyzing such assertions. Broad claims of sameness or identity were easy to make and hard to challenge. This state of philosophy and the Greek language suited Heraclitus' purposes: his approach to the unity of the cosmos through the *logos* required associating ideas rather than analyzing or separating them. He needed to bring things together before bringing them apart again.

I suggest that this same associative approach is behind the Pythagorean move from Stage 1 to Stage 2. To move from saying that (some) things resemble numbers and that numerical properties are important or even the most important features of (some) things to saying that all things are *made in the likeness of* numbers or that they *are by imitation of numbers*, or that they *are* numbers or are *composed of numbers* may even have been an inevitable step in the context of early presocratic thought. Once they had come to believe that numbers and numerical relations are fundamental to one or more kinds of entities and phenomena that they judged important or revelatory, they made the generalization that they are fundamental to all entities and phenomena, and they formulated this generalization in ways that could apply across the board. Whereas things may resemble numbers in very different ways, the tendency in Stage 2 was to erase the differences by expressing the general point in a single formula, such as "all things are numbers" or "all things are ἐκ numbers," both of which are deliciously ambiguous in how they can be interpreted. The former can be taken as a straightforward identity statement (as if the octave is literally a ratio of two numbers), or as a statement of essence (as if the essence or basic nature of the octave is the ratio 2:1), and perhaps in other ways as well. The latter can be taken as a statement indicating the composition or components of a thing (as if the octave was composed out of a numerical ratio), or as a statement indicating the source from which a thing is generated (as if the ratio 2:1 generated the octave) and perhaps in other ways as well. Different ways of taking these generalizations will work better for different things and phenomena; it is too much to hope that any one way will precisely work for them all. But these fine distinctions seem not to have been the concern of the Stage 2 Pythagoreans any more than they were for Heraclitus. Enough to have found a formulation that can work for everything.

The generalizations that mark Stage 2 amount to a working hypothesis. In effect they constitute a challenge to find the numbers for a wide variety of phenomena, which would confirm the hypothesis. This seems a reasonable way to account for the program of identifying such things as justice, soul/mind and "the right moment" with particular numbers. Alexander's apparently well informed account of the reasons for these identifications (quoted above, p. 81) helps us by providing an account of these connections. The reasons he gives for associating these things with these numbers are disparate, and some of them appear accidental and *ad hoc*—features that agree with Aristotle's picture of a group of people determined to find numerical connections by hook or by crook. It is hard to imagine what would have motivated the Pythagoreans to make these identifications unless they were already committed to the view that numbers are somehow fundamental to things.

This approach to theory construction is the antithesis of Aristotle's approach. Where it tried to bring different kinds of things together, Aristotle aimed to keep similar things apart; where it tried to synthesize Aristotle preferred to analyze. For example, there are many ways in which one thing or event can be an αἰτία (conventionally translated "cause") of another; Aristotle attempted to identify and distinguish among all those ways. It turns out that we know relatively little about the relation between two things if we only know that the one is the cause of the other. We are badly mistaken if we suppose that the one is the cause of the other in one way when it is actually the cause of the other in a different way. When he examines the views of earlier philosophers that he finds relevant to the question of the different kinds of causes, he is guilty of using Procrustean methods to fit what they said into his own theory of the "four causes." But he is trying to do something positive—to translate the earlier theories into a more precise conceptual framework. In effect he is trying to make sense out of their potentially nonsensical claims. He believes that the senses of αἰτία he recognizes are adequate to capture the meanings of earlier, vaguer claims, a belief that may well fail in the case of the Pythagoreans. It seems a hopeless task to locate their numerical accounts of phenomena under Aristotle's headings: material, formal, efficient, and final. We might suppose that the ratio 2:1 is the formal cause of the octave, but in what Aristotelian sense is the number 5 the cause of marriage? And then there is the Pythagorean ἐκ locution in **N1**, which is a common Aristotelian way of referring to the material cause: but as Aristotle pertinently asks, how can physical things be made out of numbers?[152] And if it is difficult or impossible to understand these accounts each as falling under one of the four Aristotelian headings, it is much more so to see how anyone could have thought that they all fall under the same one. This is the kind of result that Aristotle's philosophical approach can be expected to have on products of earlier ways of thinking.

When Aristotle criticizes Pythagorean views he makes comments along these lines.

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[152] See n. 104.

> From [the Pythagoreans and from Alcmaeon] we can learn this much, that the contraries are the principles of the things that are; and how many these principles are and what they are, we can learn from [the Pythagoreans]. How to bring these principles together with the causes we have named has not been clearly articulated by them. (*Metaph.* 986b2–6, tr. based on the Revised Oxford Translation)
>
> Down to the Italian school, then, and apart from it, philosophers have treated these subjects [viz. the question of causes] rather obscurely. (*Metaph.* 987a9–11, tr. based on the Revised Oxford Translation)
>
> Regarding the question of what things are they began to make statements and definitions, but treated the matter too simply. For they would define superficially and they thought that the first thing an indicated term applies to is the essence of the thing. (*Metaph.* 987a20–3, tr. from **C2**)
>
> [Plato's] divergence from the Pythagoreans in making "the one" and the numbers separate from things, and his introduction of the Forms, were due to his inquiries in the region of definitory formulae (for the earlier thinkers had no tincture of dialectic). (*Metaph.* 987b29–32, tr. based on the Revised Oxford Translation)
>
> That bodies should be composed of numbers, and that this should be mathematical number, is impossible. For it is not true to speak of indivisible spatial magnitudes; and however much there might be magnitudes of this sort, units at least have not magnitude; and how can a magnitude be composed of indivisibles? But arithmetical number, at least, consists of abstract units, while they say that the things that are, are number; in fact they apply their propositions to bodies, supposing that they consisted of those numbers. (*Metaph.* 1083b11–19, tr. based on the Revised Oxford Translation, cf. 1090a32)
>
> It is absurd to construct an account of the generation of things that are eternal, or rather it is an impossibility. There is no need no doubt whether or not the Pythagoreans construct such an account, since they say clearly that when "the one" had been constituted… the nearest parts of the unlimited at once began to be drawn in and limited by the limit. But since they are constructing a cosmos and wish to speak the language of natural science, it is fair to make some examination of their physical theories, but to let them off from the present inquiry; for we are investigating the principles at work in unchangeable things, so that it is numbers of *this* kind whose generation we must study. (*Metaph.* 1091a12–22, tr. based on the Revised Oxford Translation)

11. Conclusion

In this paper I have presented reasons to think that Aristotle did not base his account of Pythagoreanism, and of Pythagorean principles in particular, entirely on Philolaus, and that he utilized more than one source. The possibility that he had live informants is not excluded—either people he would identify as Pythagoreans themselves, or people with personal knowledge of Pythagoreans. This view accounts for several otherwise puzzling features of Aristotle's accounts of Pythagorean thought, including the almost complete absence of the name Philolaus, the references to a plurality of conflicting views held by the Pythagoreans, and some further inconsistencies in Pythagorean views as Aristotle reports them. It also makes it plausible to look for different strata in the account, which may reflect an actual historical development from the earliest stages of Pythagoreanism down to the so-called last generation of the Pythagoreans who "heard" Philolaus and Eurytus (D.L. 8.46).

I have sketched a possible history of Pythagorean thought on numbers and principles which I think is consistent with the Aristotelian evidence I have presented. It is an incomplete sketch, but it provides a rough basis for understanding some important features of Aristotle's accounts, in particular their emphasis on the Pythagorean views that things are numbers or are composed of numbers. It also suggests the possibility that Philolaus's views on principles and the role of numbers on the one hand were the acme of Pythagorean thinking in these areas, and on the other hand, were not mainstream Pythagorean doctrines. Finally I have attempted to account for Aristotle's evident frustration with some of the Pythagorean claims he reports and criticizes. It's not just that he judged them false—in this they share the fate of most features of all pre-Aristotelian theories. Rather, they originated in a way of thinking which Aristotle had rejected and against which he waged continuous warfare.[153]

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[153] It would have taken too much space in this already long paper to discuss Zhmud's important article (L. Zhmud, "'All is number'? 'Basic doctrine' of Pythagoreanism reconsidered," *Phronesis* 24 [1989] 270–292), which argues that Pythagorean number philosophy is the invention of Aristotle. Briefly, I agree with Zhmud (290) that the discovery of the numerical basis of the harmonic intervals was early (Zhmud attributes it to Pythagoras himself). Apparently unlike Zhmud, I suppose that this discovery became the catalyst for the grand claim that number is (somehow) fundamental to everything, which motivated further Pythagorean interest in numbers that was manifested in mathematical discoveries as well as in fruitless numerology, and which eventually led to accounts of the principles of numbers themselves.

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4. Philolaus' Critique of Heraclitus

Carl Huffman

There have not been many attempts to connect the philosophical systems of Heraclitus and Philolaus. At first sight, there appear to be good reasons for this failure to see a connection. The two thinkers come from opposite ends of the Greek world. Heraclitus was from Ephesus in Asia Minor and Philolaus from Croton in southern Italy, although he also visited in Thebes on the Greek mainland and may have spent his last years in a different southern Italian city, Tarentum[1]. Moreover, Heraclitus probably wrote his book ca. 500 BC, while Philolaus did not write until some seventy years later. Philolaus' immediate predecessors were figures like Empedocles and Anaxagoras, whereas Heraclitus belonged to a still earlier generation and is thus less likely to have elicited a direct response from Philolaus. Heraclitus is, moreover, famous for his paradoxical theses that apparent stability is, in fact, based on change and that apparent opposites are in some sense one. Neither this doctrine of the unity of the opposites nor the emphasis on the role of strife and change in the cosmos are to be found in the fragments of Philolaus. There have been, in addition, scholarly obstacles to connecting the two figures. The fragments of Philolaus had been thought of questionable authenticity until fairly recently, so that there was nothing to compare to Heraclitus. Heraclitus himself has been interpreted in radically different ways. Scholars cannot agree whether Heraclitus is talking about the cosmos as a whole or about human behavior, nor, if he is talking about the cosmos, whether he is an exponent of a doctrine of radical flux or the champion of a stable order. Thus, it is hard to know which Heraclitus to compare to Philolaus.

Now that a core of the fragments of Philolaus can confidently be regarded as authentic[2], however, these fragments can help us to understand both Philolaus and Heraclitus. There is not space here to argue in detail for the interpretation of Heraclitus on which I base the comparison to Philolaus, if there is to be time to compare the two thinkers. My paper can thus only claim to be a study of the relationship between Philolaus and one Heraclitus, although this is the interpretation of Heraclitus that I find most plausible and I will refer to scholarship supporting this interpretation. I will argue that Philolaus and Heraclitus do share two important themes. Both philosophers emphasize that reality does not bear its meaning on its surface, i. e. that the phenomena give signs of a deeper reality on which knowledge is based. Both philosophers also emphasize the role of *harmonia*, "fitting together," in explaining the cosmos. They differ concerning what it is that the phenomena give signs of and on the nature of the *harmonia.* In addition, although nothing in the fragments of Philolaus suggests that he was responding directly to Heraclitus or wrote with specific passages of Heraclitus' book in mind, I will also argue that the fragments of Philolaus offer a strong implicit critique of Heraclitus' metaphysical principles. Philolaus, in part, accepts Heraclitus' analysis of the substances and powers that make up the cosmos, but his system can also be seen as a critique of Heraclitus for his failure to give an adequate account of the structural features of the world.

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[1] C. A. Huffman, *Philolaus of Croton: Pythagorean and Presocratic* (Cambridge 1993) 6.

[2] W. Burkert, *Lore and Science in Ancient Pythagoreanism* (Cambridge, Mass. 1972); Huffman *Philolaus* (above, n. 1).

One of the most prominent themes in the fragments of Heraclitus is the emphatic assertion that the truth about reality does not lie on its surface; human beings must interpret the raw data of phenomena in order to come to a deeper understanding of reality. The clearest statement of this theme is found in B 123: φύσις κρύπτεσθαι φιλεῖ, which, as Graham has shown, should properly be translated not as a personification of nature but impersonally: "it is characteristic of nature to be hidden"[3]. Our first encounter with the world gives us not the true nature of things but hints or indications that point to that true nature. Heraclitus models his own discourse on this characteristic of the world. Thus, the description of the Delphic oracle in Fr. 93 is usually taken as a description of both the phenomenal world and also the words of Heraclitus: "The lord to whom the oracle at Delphi belongs neither tells nor conceals but gives a sign." An oracle given by Apollo cannot be taken at face value and requires interpretation. When Apollo tells Croesus that he will destroy a great empire, Croesus comes to grief because he does not take time to interpret the oracle. He does not enquire which empire is meant but simply assumes that the empire is that of his enemy, Cyrus[4]. Similarly, to understand either the world or Heraclitus' words, it is necessary to be able to interpret the signs[5]. Thus, one must value what the eyes and ears reveal to us of the world, as Heraclitus says in B 55, but also recognize that "the eyes and ears give bad evidence for those who have souls that do not understand the language"[6]. Human beings must understand the language of the phenomenal world, if they are to interpret the signs that it gives about the true nature of things. This emphasis on the hidden nature of reality that is nonetheless close at hand, for those who can read the signs, explains Heraclitus' constant lament about the failure of most people to see the truth, which is presented as common to all[7], and his comparison of most people to those who are asleep[8].

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[3] D. Graham, "Does nature love to hide? Heraclitus B 123 DK," *CP* 98 (2003) 175–179.

Heraclitus uses several images to describe the reality to which the phenomena point. In B 54, he says that "the *harmonie* which is hidden is better than the one that is evident." Once again the emphasis is on going beyond that with which our senses initially present us, beyond what can be seen, to what is hidden. This time, however, we are told that the nature that lies hidden is an *harmonia*, i. e. a fitting together or attunement of disparate things into a unity. The Greek word has several different connotations, all of which may be relevant in interpreting Heraclitus. A ἁρμονία comes to refer to the fitting together of notes into a musical scale, so that B 54 might be stating the paradox that the music that is not evident, that we do not hear, is better than the music that we do hear. In typical oracular fashion, Heraclitus challenges us to figure out what is meant by music that is not evident. Kahn[9] suggested that we might think of the Pythagorean music of the spheres, which according to the reports of the later tradition only the master could hear[10]. He rightly rejects this approach, both because it is not certain that the conception of the harmony of the spheres did go back to Pythagoras and thus had been promulgated by the time of Heraclitus, and more importantly because it would be surprising to see Heraclitus embrace such a distinctively Pythagorean doctrine, given his virulent criticism of Pythagoras elsewhere in the fragments. Pythagoras is called the prince of imposters and is said to have practiced a polymathy that led not to understanding but rather to an evil trickery (Frs. 81, 40, 129). It is surprising, then, that Kahn goes on to argue that by the hidden harmony Heraclitus is referring to another prominent idea in the Pythagorean tradition, which may go back to Pythagoras himself and is certainly present in Philolaus, i. e. the correspondence between the musical concords (what we today call "perfect" intervals) such as the octave, fifth and fourth and the whole number ratios 1:2, 2:3 and 3:4. According to Kahn, Heraclitus' non-evident attunement, the music which we cannot hear, is constituted by these whole number ratios. Kahn's previous argument would seem to work against his own suggestion here. Does it make sense to suppose that in praising "the hidden *harmonie*" Heraclitus is adopting as a central feature of his system a distinctive idea of that Pythagoras whom he treats with such contempt elsewhere? Moreover, it is going far beyond any evidence we have to suppose that Heraclitus was referring to the whole number ratios that are connected to the musical concords; these ratios appear nowhere in the fragments of Heraclitus.

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[4] Herodotus 1.91.
[5] Kahn, *H.* 123–4.
[6] B 107.
[7] B 3.
[8] B 1.
[9] Kahn, *H.* 202–4.
[10] Por. *VP* 30, Iamb. *VP* 66.

In order to make sense of Heraclitus in his own terms, it is necessary to remember that in a more basic sense ἁρμονία refers not just to musical structure, but to any fitting-together of elements into a whole. Thus the verb ἁρμόζω is used already in Homer to describe Odysseus' fitting-together of pieces of wood to create a raft, and the ἁρμονίαι are the joints[11]. It is thus reasonable to translate ἁρμονία in some contexts as "structure." Kahn indeed suggests that "hidden structure … might thus be taken as a general title for Heraclitus' philosophical thought"[12], and Hussey translates ἁρμονίη ἀφανής as "latent structure"[13]. B 51 suggests that it is this more general sense of *harmonia* that is most relevant for Heraclitus, although the musical meaning is present as well: "They do not understand how in differing with itself it agrees, a backward turning structure (ἁρμονίη) just like that of a bow or a lyre." The image of the bow and the lyre in this fragment is complex, and I will focus on just a few aspects of it here. The evident structure of the bow and lyre is the combination of wood and string to form an apparently stable and static object. Most people do not understand that this agreement of the parts of the lyre or bow is based on a difference between them; the difference, the strife between the strings and the wood of the bow and the lyre, although not evident, is nonetheless the true structure that underlies the apparently static structure. It is not only the bow or the lyre that are held together by such a structure, however. Heraclitus is arguing that there is such a hidden fitting-together for everything in the world and indeed for the world as a whole.

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[11] *Od.* 5. 247–8.

[12] Kahn, *H.* 203.

[13] E. Hussey, "Heraclitus," in A. A. Long (ed.), *The Cambridge Companion to Early Greek Philosophy.* (Cambridge 1999) 91.

In our best source for B 51, Hippolytus, the *harmonia* of the bow and lyre is described as "backward turning" (παλίντροπος), while some other sources report the common Homeric epithet for a bow, "backward stretched" (παλίντονος); scholars have been divided as to which reading to accept. [14] "Backward turning" is clearly preferable as the *lectio difficilior.* As Kahn[15] has argued, however, this adjective is intended to remind us of the tension on which the bow and lyre are based by an allusion to the Homeric epithet, "backward stretched." In the transmission of the text, this allusion was sometimes taken too seriously and "backward stretched" was incorporated into the text instead of the more unusual "backward turning." At the same time, however, Kahn argues that "backward turning" alludes to the turnings (τροπαί) or changes of state of the cosmic fire, which are described in B 31 A: "The turnings of fire, first sea, and of sea the half is earth and the half is lightning." B 51 thus indicates that the hidden *harmonia* of B 54 is in part a reference to the constant transformation between opposites such as the hot and the cold, which makes such opposites just phases on a continuum of temperature. The hidden *harmonia* thus turns out to be a reference to the famous Heraclitean "unity of the opposites," which asserts that apparent opposites such as hot and cold are, in fact, one. What is real is not the transitory phases, hot and cold, but the unified continuum of temperature of which they are parts. Thus, in B 126, Heraclitus asserts "Cold things become hot, hot things become cold, wet things dry up, dry things become damp."[16]

As Graham has suggested, it appears that Heraclitus is presenting a critique of Ionian cosmology, which had mistakenly supposed that powers and substances such as the hot or air were ultimate realities, when they were just phases of the continual change, which is the true reality.[17] Graham puts it very well in saying, “In effect each substance is not a permanent thing, a stable reality, but a stage in the sequence of transformations. What then is real? Only the process of transformations itself.”[18] This then is the explanation of the role of fire in Heraclitus. To quote Graham again, “… fire is the most changeable, ephemeral, the least tangible and stable of things; thus it is the least substantial of all substances, the substance that is not a substance, the substance that is a process.”[19] I would suggest, then, that for Heraclitus the opposites define and are united in continua in which powers, such as different degrees of hot and cold, or substances, such as air and water, are transitory phases. Thus the hidden *harmonia* is more likely to be a reference to this famous Heraclitean unity of opposites than to the whole number ratios that govern the musical concords. It is not completely clear whether Heraclitus is arguing that there are a number of different continua that unite opposites, e. g. a continuum of temperature that unites hot and cold, a continuum of moisture that unites dry and wet etc., or whether he is arguing that all oppositions are ultimately united in one continuum. His assertions that “all things,” “god,” or “the wise” are one suggest the latter interpretation.[20] In B 67, god is described as uniting a series of such continua: “God, day night, winter summer, war peace, abundance famine”[21].

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[14] See, e.g., Kirk, *H.* 210–216, and G. Vlastos, "On Heraclitus," *AJP* 76 (1955): 337–378.

[15] Kahn, *H.* 199–200.

[16] R. Dilcher, "On the Wording of Heraclitus, Fragment 126," *CQ* 44.1 (1994) 276–277.

At this point it is illuminating to turn to Philolaus in order to note two similarities in approach with Heraclitus. First, Philolaus also emphasizes that human beings will not understand reality just by looking at the phenomena presented to them by their senses. Things once again point to a more basic reality. This theme is clearest in B 5. After identifying two basic kinds of numbers, the even and the odd, Philolaus says, “Of each of the two kinds there are many forms, of which each thing itself gives signs.”[22] The many forms of the even and the odd may just be the series of even and odd numbers. Philolaus argues that each thing in the world gives signs of or points to these numbers. He uses the same verb, which Heraclitus used to describe the Delphic oracle as giving signs, signs that are in need of interpretation. It is certainly not the case that things appear on their surface to have anything to do with numbers but, so Philolaus suggests, closer study shows that there are indications, signs, that they are ultimately based on numbers. The clearest examples are the whole number ratios that govern the musical concords to which Philolaus refers in B 6a. When an octave is heard, we do not immediately perceive a number in it but, if we examine the phenomenon of the octave, we will discover that strings whose lengths are in the ratio 2:1 will produce the interval of an octave, when plucked in succession. B 4 makes explicit what is implicit in B 5, that we only gain true understanding of things, when we come to understand the numerical structure to which they point and on which they are based: "And indeed all things that are known have number. For it is not possible that anything whatsoever be understood or known without this." In order to really understand anything, we must understand the numbers of which it gives signs.

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[17] D. Graham, “Heraclitus’ Criticism of Ionian Philosophy,” *OSAP* 15 (1997) 1–50.

[18] Graham (above, n. 17) 35.

[19] Graham (above, n. 17) 37.

[20] B 50, 67, 32.

[21] Kahn, *H.* 278.

[22] For the text of the fragment, see Huffman *Philolaus* (above, n. 1).

Philolaus, like Heraclitus, thinks that human beings first experience things through their senses and he appeals to what the senses tell us twice in a crucial argument in B 2. Philolaus regards it as manifest (φαίνεται) from our direct experience of the world that it is not composed just of components that are unlimited or just of components that limit, but that both sorts of components are necessary: "it is manifest that they [the cosmos and all the things in it] are neither from limiting things alone nor from unlimited things alone." When we look at something in the world, such as a forest, we see not just unlimited, unstructured stuff, such as wood, nor just elements that impose limits and structure, such as shapes. We see wood that has the structure of trees. I will return to this important point in a moment but what is crucial here is to see that, while Philolaus does appeal, here in B 2, to what is manifest to the senses in order to establish certain general features about the cosmos, i. e. that it is composed both of what is unlimited and what limits, B 4 and 5 show that he, like Heraclitus, does not think that we gain a true understanding of anything unless we go beyond what is manifest at first sight to grasp the underlying structure, which governs what we perceive. Philolaus differs from Heraclitus in making explicit that the underlying structure is numerical. I will also return to this point in a minute.

A second striking point of similarity is that, as in Heraclitus, Philolaus too argues that understanding the nature of the cosmos and indeed the nature of everything in the cosmos means coming to understand an ἁρμονία. The opening lines of Philolaus' book stress that "nature in the world-order was fitted together (ἁρμόχθη) both out of things which are unlimited and out of things which are limiting, both the world-order as whole and everything in it." This is an explicit assertion that nature, the nature of the cosmos as a whole and of all things in it, is an attunement of parts, is a structure. This intimate connection between nature and *harmonia* is also seen in B 6 of Philolaus, which begins "Concerning nature and *harmonia* the situation is this…" This pairing of the two concepts suggests that they are closely connected and that in order to understand nature it is necessary to understand *harmonia.* Philolaus and Heraclitus thus agree that things give signs of a *harmonia.* Again, however, the further characterization of *harmonia*, which Philolaus will give in B 6a, as having a numerical structure, the numerical structure of the diatonic scale, shows that the ultimate nature of the *harmonia* is more explicitly arithmetical in Philolaus than Heraclitus.

It is now time to turn from the broad similarities between Heraclitus and Philolaus to the substantial differences that constitute Philolaus' critique of Heraclitus. First, Philolaus appears to accept Heraclitus' conception of *harmonia* as a starting point but to move beyond it. For Heraclitus the hidden *harmonie* is constituted by his doctrine of the unity of opposites, the surprising connection of opposites such as hot and cold, up and down in one continuum. In part this connection is logical and not empirical. Hot and cold, light and dark, up and down are only intelligible in terms of one another and thus cannot be separated logically from one another. Heraclitus' famous assertion of method that "I searched myself" (B 101) may refer to his turning inward to examine the logic of such opposites independent of experience. In the case of the natural world, this logical connection becomes a physical connection through the doctrine of constant change, which makes hot and cold, dry and wet, light and dark, just phases in larger continua. One way of understanding Philolaus is to suppose that he has adopted Heraclitus' point and accepts that the world is composed of an indefinite number of such continua. Where do such continua appear in Philolaus? I suggest that he made them one of the two basic types of components of the cosmos and called them τὰ ἄπειρα, the unlimiteds. In Heraclitus' unity of opposites doctrine, as I have sketched it above, the opposites are one because they are parts of a constantly changing continuum. Such a continuum is not made up of defined stable entities, but rather consists of transitory phases. It is precisely because the parts of such a continuum are not defined stable states that they can be said to be one. The continuum of temperature cannot be labeled hot or cold or any other temperature but is in itself without clear internal boundaries; this is the sense in which it is *apeiron*. It is plausible to regard Philolaus as having reflected on this aspect of Heraclitus' thought and as having drawn the crucial conclusion that what is most fundamental about opposites such as hot and cold or substances such as fire and air is not their particular qualitative character, but rather that they are parts of continua or are themselves continua. It is these continua without any internal boundaries, i. e. τὰ ἄπειρα, the unlimiteds, that are ultimate realities, not the transitory phases of the continua.

Philolaus' candidates for membership in τὰ ἄπειρα are good candidates for the kind of continua Heraclitus was talking about. In B 6a Philolaus treats sound as an ἄπειρον, and in Heraclitean terms sound can be regarded as a continuum, which is the unification of the opposites high and low pitch. A fragment of Aristotle's book on the Pythagoreans,[23] which appears to be describing Philolaus' cosmogony, reports that "from the unlimited time and breath were brought in, as well as the void," thus suggesting that time, breath, and void are themselves unlimiteds for Philolaus. Similarly, in B 7, since the central fire is described as "fitted together," and elsewhere when things are fitted together they are said to be combinations of limiter and unlimited, it is probable that fire is being treated as an unlimited, which is combined with the limiting notion of center to form the central fire. All of these unlimiteds can be regarded as Heraclitean continua. In the case of time and void, it is the opposites before and after that are unified in a temporal and in a spatial continuum, respectively. For Philolaus, at the level of both the macrocosm and also the microcosm, the first step in generation is for cooling breath to be drawn in by the heat of fire. The central fire draws in cooling breath[24] just as the newborn child does.[25] Breath and fire are parts of a Heraclitean continuum of elemental change which unites the opposites hot and cold, but parts of continua are continua themselves so that breath and fire are treated as themselves unlimiteds. What Philolaus shares with Heraclitus in all these cases is the thesis that what is most fundamental about such things as void, time, breath, and fire, is not any specific qualitative characteristics they may have but rather that they are continua. Philolaus, like Heraclitus, is asserting the essential malleability of entities such as breath and fire, which other Greek thinkers assumed to be fundamental realities.

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[23] B 201.

[24] Aristotle Fr. 201.

[25] Philolaus A 27.

Unlike Heraclitus, however, Philolaus shows no inclination to suppose that these separate continua are somehow united in a single continuum so that all things are one. Instead, he seems to regard it as obvious that the world is composed of a variety of such continua, and in B 6 argues that further specification of a privileged set of continua is beyond human competence: "… the being of things which is eternal and nature in itself admit of divine and not human knowledge, except that it was impossible for any of the things that are and are known by us to have come to be, if …both the limiting and the unlimited things did not preexist." Our experience tells us that the world is constituted by limiting things, to which I will turn in a minute, and by unlimiteds or continua. There are a large number of continua (sound, time, space, fire, breath etc.), but our experience does not allow us to say any more than that. One striking thing about Philolaus' adoption of Heraclitus' point is that what was for Heraclitus a startling and paradoxical assertion of the unity of opposites, which had to be explained by a hidden *harmonie*, is regarded as obvious. The unity of opposites in continua is now an unremarkable logical truth, and Philolaus does not invoke *harmonia* to explain how such opposites can be held together. *Harmonia* plays a different role in Philolaus.

In order for the new role of *harmonia* in Philolaus' philosophy to become intelligible, it is first necessary to consider something new that Philolaus has seen and of which Heraclitus had only a partial glimpse: the need for structural as well as material first principles in order to explain the cosmos. Heraclitus' *harmonie* of opposites is based on constant change in a continuum, but he asserts in several places that this change is not random or irregular and that it has measure. The clearest assertion of this point is found in B 30: "This cosmos, the same for all, neither any of the gods nor of men made, but it always was and is and will be an ever living fire, kindling in measures and being quenched in measures (μέτρα)." Thus, the constant change across a continuum that is the cosmos proceeds according to measures. In another fragment Heraclitus asserts that "the sun will not go beyond his measures, but if he does the Furies, the assistants of Justice, will find him out."[26] It is controversial what the measures of the sun are to which this fragment refers. The text of the fragment in Plutarch uses the same word as in B 30, μέτρα. The quotation of the fragment in the Derveni papyrus, however, suggests that the original text may have been οὔρους, which is an Ionic form of ὅρους, whose basic meaning is boundary or limit[27]. It has commonly been assumed that these boundaries are all the regularities of the sun's behavior. The Derveni papyrus, however, quotes B 94 as forming a continuous text with B 3, in which the sun is described as having the size of a human foot. Thus the boundaries of the sun may be simply the boundaries of the apparent size of the sun as equal to one human foot[28]. For my purposes here, however, exactly what the boundaries are is less important than the fact that the sun has limits and measures. There is an interesting difference between these measures of the sun and the measures of fire. In the case of the sun, the measures appear to be imposed from outside by Justice and her ministers, the Furies. In the case of the cosmic fire, however, it sounds as if the fire is self-regulating; the limits arise from the fire itself, which kindles itself and quenches itself in measures. Long has suggested that it is this self-regulating aspect of fire that, in part, led Heraclitus to give it its privileged position in his system[29].

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[26] B 94.

Philolaus finds Heraclitus' account of structure and measure in the cosmos problematic. Where do these measures and limits come from? Saying that they are imposed by the god is as good as giving no answer. Nor is it enough to say that the cosmos is a fire behaving according to measures. Why does the fire behave in this way? Philolaus argues that we cannot explain the world just in terms of the unified continua, which Heraclitus has identified as the true reality and which Philolaus incorporates into his own system as τὰ ἄπειρα, unlimiteds. Principles of measure and structure, limiters, must have equal status as first principles. B 2 sets out the possibilities "It is necessary that the things that are be all either limiting, or unlimited, or both limiting and unlimited and not in every case unlimited alone." By "the things that are" Philolaus means the basic principles of the world. Logically these principles could be 1) all limiting or 2) all unlimited or 3) both limiting and unlimited. It is this third possibility for which Philolaus goes on to argue: both limiters and unlimiteds are fundamental principles. Even in his statement of the three possibilities, however, Philolaus makes clear that he is particularly anxious to argue against the second possibility, i. e. that all things are unlimited, since in stating the third possibility, i. e. that things are both limiting and unlimited, he adds pointedly, " and not just unlimited." He appears to be correcting earlier thinkers, such as Heraclitus, who had supposed that the world could be explained in terms of unlimiteds alone. Philolaus argues that we must recognize that measures, limits and structure are features of reality, which cannot be eliminated, and that such structure is not inherent in continua. The cosmos is not a fire alone, but it has a central fire and other fires delimited within it.

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[27] G. Betegh, *The Derveni Papyrus: Cosmology, Theology and Interpretation.* Cambridge 2004.

[28] D. Sider, "Heraclitus in the Derveni Papyrus," in A. Laks and G. Most (eds.), *Studies in the Derveni Papyrus*, (Oxford 1997) 140; see also A. Finkelberg, "On Cosmogony and Ecpyrosis in Heraclitus," *AJP* 119 (1998): 195–222.

[29] "Heraclitus," in E. Craig (ed.), *Routledge Encyclopedia of Philosophy*, London 1998.

The difference between Heraclitus and Philolaus regarding structure can be further clarified by examining another Heraclitean image, the *kykeon*, a drink composed of barley, cheese and wine, which has to be stirred and still in motion when one drinks it in order to realize its full nature. Mouraviev[30] has raised important questions about the text of this fragment, but appears to agree with most scholars that Heraclitus uses the *kykeon* as an analogue to the cosmic order[31]; as constant motion is necessary to keep the barley and cheese from settling out in the *kykeon*, so constant motion is what maintains the celestial order of sun, moon and stars, including the measures of the sun mentioned in B 94. Heraclitus thus appears to think that constant motion across a continuum is all that is needed to explain the cosmos. The measures and order of the cosmos somehow arise out of the constant change in the continuum, analogously to the order that arises out of the ingredients of the *kykeon* in motion[32]. It is this emergence of measures and limits out of the unlimited continuum that Philolaus regards as unintelligible. In B 2, he goes on to argue for the third logical possibility, that both limiters and unlimiteds are first principles, by starting from our experience: "it is manifest that they [i.e. the cosmos and the things in it] are neither from limiting things alone nor from unlimited things alone," i. e. in the world around us, we easily identify continua like temperature, water and earth, but also limits such as shapes. Heraclitus' references to measures and limits suggest that he would agree with Philolaus up to this point. Philolaus goes on to argue, however, that "it is clear then that the world-order and the things in it were fitted together from **both** limiting **and** unlimited things;" the limiting and unlimited features of the world we observe can only be explained on the assumption that the world has as starting points, as ἀρχαί, both limiters and unlimiteds. Philolaus continues, "Things in their actions also make this clear. For, some of them from limiting constituents limit, others from both limiting and unlimited constituents both limit and do not limit, others from unlimited constituents will be manifestly unlimited." Philolaus' point is clearest in the last case, "…others from unlimited constituents will be manifestly unlimited." If the starting points are unlimited what arises from them will be unlimited. From clay alone, all we get is an undifferentiated quantity of clay, not a vase. It is not possible for limit to arise from what is in its nature unlimited. Material in motion cannot in itself explain the order that is observed in the cosmos. Heraclitus is mistaken if he thinks that measures can arise from a burning fire.

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[30] S. N. Mouraviev, "The Moving posset once again: Heraclitus Fr. B 125 in context," *CQ* 46 (1996) 34–43.

[31] Kahn, *H.* 194.

[32] B 125.

Whereas Heraclitus tends towards monism, Philolaus always uses plural nouns to describe his first principles, i.e. ἄπειρα, unlimiteds, and περαίνοντα, limiters. It would appear that he thought that the cosmos originated from an irreducible plurality of both limiters and unlimiteds. It is natural, then, to ask how many continua and how many structural principles there are. Philolaus, however, denies that this knowledge is accessible to human beings. In B 6, when Philolaus focuses on the most fundamental principles of reality, what he calls the "the being of things" and "nature in itself," rather than identifying a basic set of stuffs, as, for example, Empedocles does, he says that such principles admit "of divine and not human knowledge." There is one large exception, i.e. "that it was impossible for any of the things that are and are known by us to have come to be, if the being of the things from which the world-order came together, both the limiting things and the unlimited things, did not preexist." What human beings can know about ultimate reality is precisely that the basic principles must include both continua, unlimiteds, and also principles of structure, limiters, in order for the cosmos that we observe to have arisen. What humans cannot know is what and how many unlimiteds and what and how many limiters are basic principles. Philolaus does not see any way to determine that there are just four elements, as Empedocles does. There may once again be a partial similarity with Heraclitus on this point, since, on one interpretation, Heraclitus also denies that it is possible to identify any one phase of the changes in the material continuum that is the cosmos as more fundamental than any other. On this reading, he is not identifying fire as the most basic of substances but rather uses fire as a symbol of the continuum in constant change, which he regards as more basic than any of the phases of that continuum[33]. Heraclitus, however, appears to draw the conclusion not that there are an indefinite number of continua all equal to one another, as Philolaus does, but rather that there is just one principle, the continuum, of which fire, water, earth and air are phases; he refuses to posit structural first principles at all.

If we agree with Philolaus, however, that both sorts of basic principles must be presupposed, both limiters and unlimiteds, another problem arises. How is the relationship between limiters and unlimiteds to be conceived? Heraclitus taught that opposites such as hot and cold are connected by a *harmonie*, in that they are united as phases of constant change across a continuum. I have argued that Philolaus accepted this sort of unity. B 6 shows that Philolaus regards such a unity of opposites as unremarkable and as not even requiring an appeal to a *harmonia* in order to explain it. Hot and cold are not so different after all. They are, in fact, alike as being parts of the same continuum. In B 6, Philolaus argues first that things that are alike (ὁμοῖα) are not in need of any *harmonia*. He is probably appealing here to the principle widely recognized among early Greek philosophers that like naturally coheres with like[34]. There is no need to invoke any further explanatory principle to explain why water coheres with water or earth with earth. Philolaus takes the point a step further, however. He argues that even things that are ὁμόφυλα, literally "of the same tribe," naturally cohere. In Greek city-states the tribe was the most general term of affiliation. At Athens you were the member of a family first, then a clan, then a brotherhood or phratry, and finally a tribe. Obviously a tribe could embrace people with even diametrically opposed points of view. In the Hippocratic treatises the term again indicates a similarity at the most general of levels; it refers to copulating partners as being of the same species in order to produce offspring[35]. Thus, Philolaus might well argue that opposites that are part of a continuum, such as hot and cold, while not alike, are "part of the same tribe," are naturally related to one another and not in need of any *harmonia* in order to fit them together.

The situation is different when we look at Philolaus' basic principles, limiters and unlimiteds. A limiting shape such as a circle and an unlimited continuum such as water or earth are two quite different sorts of reality, yet Philolaus argues that these two radically different sorts of things must work together in order to account for the cosmos. Thus, in B 6, Philolaus asserts that "since these beginnings [ἀρχαί, i.e., limiters and unlimiteds] preexisted and were neither alike nor even related ("of the same tribe," ὁμόφυλοι), it would have been impossible for them to be ordered, if a harmony had not come upon them." He supports this assertion by stating the general principle that "things that are unlike and not even related nor even of the same order [reading ἰσοταγῆ], it is necessary that such things be bonded together by a harmony, if they are going to be held in an order." Thus, that master of paradox, Heraclitus, was dealing with something quite tame when he asserted that opposites such as hot and cold were one. It is much more of a challenge to explain how center and fire can be combined to form the unity known as the central fire. We might well want to say that Philolaus is making some sort of category mistake in regarding center and fire as parts of the cosmos in anything like the same sense, but Philolaus' language in B 6 suggests that he is all too aware of the seemingly unbridgeable gap between the sense in which fire is part of our cosmos and the sense in which center is a part of our cosmos. He emphasizes that limiters and unlimiteds are not just unlike (οὐχ ὁμοῖαι) one another, they are not even of the same tribe (οὐδ' ὁμόφυλοι). He went on to use yet another adjective in order to indicate the vast difference between limiters and unlimiteds. He may well have used a neologism to highlight the difference, since the manuscripts provide the apparently impossible reading "not of equal speed" (μηδὲ ἰσοταχῆ). Heidel's emendation μηδὲ ἰσοταγῆ ("not of the same order") is perhaps the most plausible. Philolaus would then, in fact, be recognizing that limiters and unlimiteds do not belong even to the same category of being. Here is a real gap, which we must bridge with some sort of attunement. Up to this point I have avoided using the language of form and matter, and I will continue to do so, in the belief that it is less misleading to understand Philolaus' insight in his own terms and those of his contemporaries and predecessors. Nonetheless, it may be helpful to make the point by saying that Philolaus is the first person to see that formal features are just as important as material features in explaining the world and is hence the first person to grapple explicitly with the problem of how form and matter can be related.

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[33] E.g., Graham (n. 17 above).

[34] Democritus B 164.

[35] Hipp. *Nat. hom.* 3.3.

It is worth emphasizing one aspect of Philolaus' answer to the problem of relating the limiting features of the world to the unlimited features. As I have suggested above, since Philolaus can see no way in which limits and measures can arise from what is unlimited, he argues that limiters no less than unlimiteds must be assumed as first principles or starting points for the cosmos (ἀρχαί). Given this argument, which suggests a strong parallelism between limiters and unlimiteds, it is not at all surprising that, as the first thinker to take limiters seriously, Philolaus should suppose that limiters are just as much components of the cosmos as unlimiteds. The limiter "sphere" is just as much a part of the cosmos as an unlimited, such as earth. This equality of treatment of limiters and unlimiteds is shown in the strict parallelism between limiters and unlimiteds in all assertions of his basic thesis about the cosmos; in every case limiters and unlimiteds are joined by the simple conjunction "and" (καὶ) or the paired conjunctions "both … and" (καὶ … καὶ, τε καί). This reading of Philolaus' treatment of limiters is confirmed by Aristotle. Aristotle only mentions Philolaus by name once, but the philosophical system, which he assigns to a group of thinkers whom he labels "the so-called Pythagoreans" and which he dates to exactly the time when Philolaus was active, is so similar to what we find in the fragments of Philolaus, that there is little doubt that these fragments are one of Aristotle's principal sources. One of Aristotle's central points about this system is that no separation between numbers and things is recognized. He also complains that numbers are treated as if they were physical bodies[36]. It seems to me that Aristotle is slightly misreading Philolaus here, since Philolaus never puts numbers on the same level as material objects; it is always limiters, not numbers, which are paired with unlimiteds. Nonetheless, Aristotle is right to emphasize that, while Plato does separate forms from things, the Pythagoreans do not[37]. The fragments of Philolaus support such a conclusion insofar as they treat the limiting formal aspects of reality on all fours with the unlimited material elements and suggest no hierarchical relationship. It is important to emphasize, however, that the evidence suggests that Platonic forms did not originate from Pythagoreanism but rather from Socratic dialectic, so that while Philolaus' limiters are an attempt to account for formal aspects of the cosmos, they have a quite different origin than Platonic forms and hence are quite different in nature[38]. Aristotle regarded it as unintelligible that the Pythagoreans should treat formal elements as if they were material components of the cosmos, but as we have seen Philolaus is not totally unaware of the difficulty. While he emphasizes in B 6 that the cosmos is not intelligible unless we assume limiters as first principles alongside unlimiteds, he also highlights the difference between these two sorts of principles by describing them as not even of the same tribe. How then can these unlike but equally important principles of the cosmos be combined? It is here that numbers enter Philolaus' system.

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[36] *Metaph.* 1083b ff.

[37] *Metaph.* 987b28.

[38] C. A. Huffman, "Philolaus" (1998), in Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy*; <http://plato.stanford.edu/archives/fall2008/entries/philolaus/>.

In B 6, Philolaus is emphatic that it is because limiters and unlimiteds are so unlike that they are in need of a *harmonia*, a principle to fit them together. As we have seen, from Philolaus' point of view, opposites like hot and cold, which Heraclitus thought in need of fitting together, are close relatives in comparison to a limiter like a sphere and an unlimited like earth. B 6 does not say what this *harmonia* consists of, just that one is required, if limiters and unlimiteds are ever to be combined into a cosmos, into an ordered world: "… things that are unlike and not even related nor of the same order [?], it is necessary that such things be bonded together by harmony, if they are going to be held in an order." In B 6a, which may be a direct continuation of B 6, Philolaus is much more specific about what a *harmonia* is and begins by asserting that "the magnitude of *harmonia* is the fourth and the fifth." Here the *harmonia* is being equated with the musical interval known as the octave, which is composed of two intervals, the fourth and the fifth. The octave and these two other intervals will then be identified with the ratios 2:1, 4:3, and 3:2 respectively. Thus, for Philolaus, a *harmonia* is not defined by constant change across a continuum as in Heraclitus, but instead is a number or more accurately a ratio. It looks as if the numbers of which things in the world give signs are at least in part the numerical ratios that govern the musical concords. Problems immediately arise. What sense can be made of the idea that numbers are what fit together limiters and unlimiteds? How can numbers make such unlike things as limiters and unlimiteds, structural principles and continua, work together? Meinwald has recently suggested that the idea of a ratio between a structural principle and a material principle is deeply problematic and that this problem led Plato in his later metaphysics to introduce the great and the small as a modification of Philolaus' account of the unlimited. Instead of supposing that there is just an unlimited continuum, the continuum is a dyad defined by the great and the small. The ratio then becomes more intelligible as a ratio between two unlimiteds such as hot and cold, which express greater and lesser degrees of temperature. According to Meinwald, Plato then hoped that all forms might be defined by such ratios of unlimiteds[39].

Philolaus' clear identification of harmonia with numerical ratios[40] need not mean, however, as Meinwald suggests, that he envisioned the ratios as ratios between limiters and unlimiteds. What he may have been thinking can be most easily understood in terms of the process of making something, e. g. a statue or a temple. Philolaus' own example seems to be the making of a musical scale, which at first sight appears unhelpfully abstract. Such an activity can be made concrete by thinking of the tuning of an actual lyre or of experiments on a monochord. I will use the monochord as an example, although there is no good evidence that it was this of which Philolaus was thinking. The string which is used to make the monochord is an example of something that is unlimited, something that is a continuum. If a bridge is inserted under the string somewhere, so that the whole string can no longer vibrate but only each of the parts, a limit has been imposed on the continuum. In the abstract the bridge could go anywhere along the continuum, but once placed it defines a specific length of string. The two parts of the string now have numbers, which are determined by the placement of the bridge. If one part is twice as long as the other, then one part has the number two in relation to the number one of the other. Now bridges could be inserted at any point along the continuum but, when placed in most positions, the intervals that arise from plucking the two parts of the string will not be pleasing to the ear. If, however, the bridges are placed so that the string lengths have the ratios 2:1, 3:2 and 4:3, the concordant intervals of the octave, fifth and fourth are produced. This example shows how it is that numbers do hold together limiters and unlimiteds. In one sense, any time a limit is imposed on an unlimited, any time a bridge is placed under a string, a number arises. The string cut off by the bridge will have some length. If we are trying to produce not just a random combination of limiter and unlimited, but want to impose a limiter on an unlimited in a way that produces a pleasing order, i. e. what the Greeks meant by a *cosmos*, then we will have to impose a limit on the unlimited in a way that produces specific numbers. In the case of the octave, fifth and fourth these numbers are the ratios 2:1, 3:2 and 4:3. The musical example may thus have suggested to Philolaus that any time a limiter and an unlimited are combined, a number results, and that thus it is a number that defines or fits together the limiter and the unlimited, although the number is not the same as either the limiter or the unlimited.

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[39] C. C. Meinwald, "Plato's Pythagoreanism," *AP* 22 (2002) 87–101.

[40] Huffman *Philolaus* (above, n. 1) 60.

In studying Philolaus' metaphysical scheme, it is easy to assimilate numbers and limiters and to assume that limiters just are numbers. Aristotle appears to make such an assimilation when he asserts that the Pythagoreans thought that things were made of numbers. In the surviving fragments of Philolaus, however, numbers and limiters are clearly kept separate. In statements of his central metaphysical principles, it is always limiters and never numbers that are paired with unlimiteds. Thus B 1 asserts that "nature in the world-order was fitted together out of things which are unlimited and out of things which are limiting"; it does not assert that "nature was fitted together out of things that are unlimited and out of numbers." It is in B 6 that the connection between numbers and limiters and unlimiteds becomes clear. "The things from which the world-order came together" are again identified as "both the limiting things and the unlimited things" with no mention of numbers. Philolaus is thus pointing out that the world our senses reveal to us arises both from continua such earth and also from limiters such as a spherical shape. A sphere as a geometrical entity, however, need have no specific size and hence is tied to no specific number. The propositions in Euclid's *Elements* that demonstrate the properties of spheres or circles are never about spheres or circles with specific sizes but rather about a sphere of whatever size. B 6 then goes on to point out, however, that in order for a continuum and a limiter actually to be combined to produce a physical entity, a *harmonia* or fitting-together must occur and, when Philolaus goes on to discuss this fitting-together in B 6a, it becomes clear that the continua and the limiter must be combined according to a number: e. g. the sphere must be assigned a specific diameter. Again, if the combination of limiter and unlimited is to produce a *cosmos*, a pleasing order, the number that binds them will not be just any number but one of a specific set of ratios such as those we find governing the concordant musical intervals. The crucial thing to recognize is that the number is not identical with the limiter, but arises as limiter and unlimited are combined in a specific entity.

When Philolaus asserts that it is a numerical fitting-together that makes a limiter and an unlimited an ordered whole, he is not really explaining how it is that number serves to unite limiter and unlimited. Indeed, in B 6, Philolaus admits his ignorance of how it is that this numerical *harmonia* arises. He asserts of limiters and unlimiteds that "it would have been impossible for them to be ordered, if a *harmonia* had not come upon them," but immediately adds "in whatever way it came to be," thus acknowledging that exactly how number combines limiter and unlimited is beyond human knowledge. Despite this inability to explain the precise mechanism of how number combines limiter and unlimited, Philolaus is making an important and substantial point. He has observed empirically that whenever a limiter and an unlimited are combined numerical relationships emerge and that when the combination produces a particularly pleasing order, such as that of a musical scale or indeed the cosmos as a whole, the numerical relationships are of a specific sort, e. g. whole number ratios. Philolaus' project is thus ultimately to give an account of the world in terms of the numerical relationships to which phenomena point. This project is taken over and significantly developed by his successor Archytas, as I argue in my recently published edition of the fragments of Archytas[41].

It is now time to return to Heraclitus. My presentation of Heraclitus and Philolaus' critique of him takes a position in a long standing debate about the essence of Heraclitus' message. In my presentation the central theme in Heraclitus is the paradoxical assertion of the unity of opposites, which is in turn based on constant change across a continuum. This emphasis on the theme of constant change is in accord with the interpretations of Guthrie, Popper, Vlastos, Stokes, and Barnes, among others. The opposing side of the debate argues that Heraclitus' emphasis is not on change, but on the measure and order of the change in the world. This view was advocated by Reinhardt and received its most forceful presentation by Kirk[42]. In the epilogue to his book Kirk summarizes Heraclitus' achievement as follows:

> The discovery of and emphasis on the arrangement of things, rather than their gross material constitution … is perhaps the most important one in the history of archaic speculation. Heraclitus … must be given full credit for having developed this concept so as to produce the first reasonably coherent explanation of the world of experience.[43]

My argument suggests that Kirk is wrong on this point. Heraclitus' great achievement was precisely to give a sophisticated analysis of what Kirk calls "the gross material constitution" of things. What earlier thinkers had supposed to be the basic material constituents of things –water, air etc. – turn out to be just phases in a continuum that is united by the constant change between phases. Philolaus gratefully accepts this analysis and duly identifies the unlimiteds, which are just the sorts of continua that Heraclitus identified, as one of his two basic kinds of principles.

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[41] *Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King* (Cambridge 2005) 65–67.

[42] For detailed references, see Graham (n. 17 above) 1–3.

[43] Kirk, *H.* 430–434.

There is not time here to develop all the arguments against Kirk's position. It is certainly true that Heraclitus recognizes that measure and structure are important in the world, but Heraclitus' recognition of this fact is nothing new and is, in fact, an important point of contact between Heraclitus and his predecessors. Anaximander thought that the opposites that constituted the world were governed by an order, the order that he identifies, in the sole surviving fragment of his book, as justice or *dike:* the opposites "give justice and retribution to each other for their injustice according to the order of time"[44]. Moreover, there is evidence that, just as in Heraclitus' cosmos the sun has to observe limits, Anaximander's cosmos was arranged according to clear structural principles, which related the size of the earth to the distance between the earth and the sun, stars and moon[45]. Heraclitus' rhetoric is not directed against people who fail to recognize structure or measure in the cosmos, as we would expect it to be, if Kirk's thesis were true. If Heraclitus thought that his great achievement was "the discovery of and emphasis on the arrangement of things," we would expect to find him saying things like "people think that the world is just a chaotic mixture and do not see the measures that govern it." Instead, when he says in B 54 that "the hidden attunement is better than the obvious one," he seems to be saying that people do recognize structure in the world, they just fail to understand its true basis. He instead repeatedly emphasizes that his contemporaries and predecessors fail to recognize that the world depends on strife and that the supposed opposites are united by that strife: "It is necessary to know that war is common and justice is strife and that all things come to be in accordance with strife and necessity"[46].

Someone might object that, when he calls on human beings to listen to the *logos*, in B 1 and 50, Heraclitus is precisely calling on them to pay attention to the structure in the world, which they have been neglect-ing. If *logos* is translated as structure in these fragments, however, it is important to be careful about what is meant by structure in these contexts. The *logos* is a rational account of the universe, which most human beings overlook, but it is illegitimate to assume from the word *logos* alone either that Heraclitus is focusing on structure *per se*, as Philolaus does in postulating limiters as first principles, or that Heraclitus is proposing that the world is structured according to mathematical ratios such as we find in Philolaus. The content of the rational account and the type of structure which Heraclitus heralds must be developed from the fragments themselves. In B 50, there is an explicit statement of what the *logos* tells us: "listening not to me but to the *logos* it is wise to agree that all things are one." Thus, according to B 50, the core message of the *logos* is the unity of all things, and in the rest of the fragments of Heraclitus the unity that is emphasized repeatedly is the unity of opposites. Thus it seems overwhelmingly likely that the unity which the *logos* teaches is the unity of opposites, and hence the constant change upon which that unity is based. Heraclitus is the prophet of a specific sort of structure, the unity of opposites, not of structure as a fundamental principle.

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[44] B 1.

[45] C. H. Kahn, *Anaximander and the Origins of Greek Cosmology* (New York 1960) 85–98.

[46] B 80.

It thus appears that the "discovery of and emphasis on the arrangement of things, rather than their gross material constitution," which Kirk heralds as "the most important one in the history of archaic speculation," should not be attributed to Heraclitus, but rather to Philolaus. Heraclitus and his predecessors certainly saw the world as full of structure and gave bold characterizations of some of those structures, such as Anaximander's cosmic justice and Heraclitus' unity of opposites, but their first principles remained material. Heraclitus gives the most sophisticated analysis of the nature of these material constituents of the world, but he nonetheless still tries to explain the world in terms of the constant change within material continua. Philolaus is the first thinker to object that the measures and structures that all early Greek thinkers, including Heraclitus, observed in the world cannot arise from starting points or first principles that consist only of such continua, only of unlimiteds. Structural principles must be given the same fundamental status as material principles in order to explain the structure which all observe in the cosmos. Philolaus uses precisely the rhetoric that we would expect for someone who was emphasizing that the structure of things is equal in importance to their material constitution – the rhetoric that is missing in Heraclitus. In B 2, Philolaus objects pointedly that things "are not in every case unlimited alone" and in his statements of his central thesis the "both…and" structure underlines the message that structure, i. e. limiters, is just as important as the continua, i. e., unlimiteds. "Nature in the world-order was fitted together both out of things which are unlimited and out of things which are limiting"[47]. Again, when he comes to state what the *harmonia* is that holds the cosmos together in B 6a, Philolaus presents us with whole number ratios, not with the *harmonie* of a bow or lyre, which turns out to be the unifying strife between opposites. In both Heraclitus and Philolaus, things give signs of a hidden nature. In Heraclitus the hidden nature is a material process. It is only in Philolaus that the hidden nature turns out to be a precisely defined structure, a structure determined by numerical relationships.

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[47] B 1.

— "Heraclitus," in E. Craig (ed.), *Routledge Encyclopedia of Philosophy*. London 1998. http://www.rep.routledge.com/article/A055.

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5. Heraclitus, the Rival of Pythagoras

Aryeh Finkelberg

As Walter Burkert observed,[1] towards the end of the first century of the Christian era a change in the *Verständnishorizont* of the epoch brought about a new reading of old texts; Heraclitus and Empedocles had come to be regarded as the predecessors of the Platonic-Pythagorean doctrine of the descent of the soul into the corporeal world. The authentic evidence at our disposal does not validate the Platonists' perception of Heraclitus as an eschatological thinker on a par with Pythagoras, Empedocles, and Plato.[2] Yet, considering the random character of our collection of Heraclitus' fragments, the lack of authentic evidence of a full-fledged eschatological doctrine does not indicate decisively that he had none. Theophrastus' silence about Heraclitus' eschatological teaching carries little weight as he passed over Empedocles' myth of the fallen *daimôn* as well. The Platonists' list of the eschatologists was fixed, with no traceable attempts to incorporate additional thinkers. Therefore, Heraclitus' inclusion in it cannot be explained as accidental; so denying the testimony evidential value for Heraclitus will beg the question and, considering that the other philosophers on the list were really eschatologists, a special pleading too. Consequently, we should admit that in our collection of Heraclitus' fragments the eschatological facet of his teaching is underrepresented, and we have no prospect of forming any adequate idea of Heraclitus' eschatology if we confine our discussion to the authentic evidence.

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[1] W. Burkert, "Plotin, Plutarch und die platonisierende Interpretation von Heraklit und Empedokles," in J. Mansfeld and L. M. de Rijk (eds.), *Kephalaion. Festschrift de Vogel* (Assen 1975) 137–146.

[2] G. Teichmüller, *Neue Studien zur Geschichte der Begriffe* I. *Herakleitos* (Gotha 1876) 74–75, and E. Rohde, *Psyche* (London 1925) 2.368) denied Heraclitus the belief in the survival of the individual souls for systematic reasons, namely because of its inconsistency with the theory of flux. For this and other reasons this belief was denied to Heraclitus also by H. Cherniss, *ACPPh*, 297 n. 29; M. Nussbaum, "Ψυχή in Heraclitus," *Phronesis* 17 (1972) 153–69; M. Baltes, "Die Todesproblematik in der griechischen Philosophie," *Gymnasium* 95 (1988) 101–02; M. Conche, *Héraclite* (Paris 1986) 328; and others.

Macrobius, *S. Scip.* 14.19 (= DK 22 A 15), tells us that, according to Heraclitus, our soul is "a spark of the stellar essence" (*scintillam stellaris essentiae*). Macrobius' source is uncertain, but Heraclitus' association of the souls with the stars is supported by Galen (4.786.10 Kühn):

> For he [*sc.* Heraclitus] said: "Dry radiance (αὐγή): soul is wisest [B 118]," asserting, for his part, that the dryness is the cause of intelligence (for the word "radiance" indicates this), and one should regard as better the opinion of those who, having discerned that the stars are both luminous and dry, maintain that they have the highest intelligence.

To determine what Macrobius' "stellar essence" is, we should turn to Heraclitus' account of the heavenly bodies which is intrinsically bound up with his theory of exhalation. The theories at issue are reported in Diogenes' excerpt from Theophrastus (D.L. 9.7–11 = DK 22 A 1), the relevant portion of which runs as follows:

> (9) …Exhalations arise from earth and from sea; one kind is bright and pure and the other is dark. Fire is increased by the bright exhalations, moisture, by the others…. He says… that there are bowls in the heaven with their concave side turned towards us, in which the bright exhalations are gathered and produce flames, which are the stars. (10) The brightest and hottest is the flame of the sun. For the other stars are farther from the earth and for that reason give less light and heat, whereas the moon, though it is nearer the earth, is borne through a region which is not pure. The sun, however, lies in a lucid and unmixed region… and that is why it gives more heat and light…

From the report we gather that the bright, dry, and pure exhalation is contaminated by the dark, wet, and impure exhalations in the sublunary region (an "impure region through which the moon is borne"), but higher up it becomes pure and entirely bright ("a lucid and unmixed region" where the sun and the stars lie) and is set aflame in the "bowls" of the stars.[3] If the bright and dry exhalation fills the whole area between the earth and the uppermost heaven, it must comprise both atmospheric air and heavenly fire.

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[3] Consequently, if, as Clement *Strom.* 5.14.104.3 (= B 31) tells us, "the heavens, and things they encompass," i.e., the heavenly bodies, are produced by sea; i.e., the sea exhalation, the bright and dry exhalation rises from sea, while the opposite, the dark one, rises from earth. Accordingly, in Diogenes' γίνεσθαι δ' ἀναθυμιάσεις ἀπό τε γῆς καὶ θαλάττης, ἃς μὲν λαμπρὰς καὶ καθαράς, ἃς δὲ σκοτεινάς, the opposition ἃς μέν … ἃς δέ is to be construed as a chiastic reversal of the main clause: "Exhalations arise from earth and from sea, those (i.e., the latter) bright and pure and those (i.e., the former) dark" (so, for instance, in R. D. Hicks' Loeb translation and in T. M. Robinson, *Heraclitus* (Toronto 1987) 168.

According to Aristotle *de An.* 405a24 (=DK 22 A 15), "Heraclitus says that the principle is soul, if indeed soul is the exhalation of which everything else is composed." Aristotle's reasoning in equating fire, dry exhalation, and soul is as follows: if soul is exhalation [and if exhalation is the principle], then the principle is soul. Aristotle infers the sameness of principle (fire) and soul from the synonymy of fire and exhalation, on the one hand, and of soul and exhalation on the other. This inference indicates that Heraclitus used the term "soul" synonymously with "exhalation." Now, if Aristotle equates exhalation with fire, the exhalation at issue must be bright and dry, and if this exhalation is the same as soul, it forms soul on the cosmic scale, that is the divine world soul:

> Heraclitus says that the soul of the world, which is an exhalation from moist things in it, and the soul in living beings, which is from the exhalation that is outside them and in them, are of the same kind (Aët. 4.3.12 = DK 22 A 15).

Commentators reject the report as crediting Heraclitus with a Stoic doctrine. This assessment, however, cannot be defended in view of Aristotle's testimony at *de An.* 405a24, and it is hardly consistent with B 36:

> To souls it is death to become water, to water it is death to become earth, but from earth comes water, and from water soul.

The shift from the plural "souls" to the singular "soul" in the otherwise symmetrical statement must be deliberate and significant. The plural "souls" are of course human ones perishing into water, whereas the singular "soul" into which water turns evidently refers to the bright and dry exhalation that forms the soul of the world. This conclusion is reinforced by an Orphic imitation of the fragment (Clem. *Strom.* 6.2.17.1 = 437 F Bernabé = fr. 226 Kern): "Water is death to soul, an exchange for water, / and from water earth, and from earth water again, / and from it soul, altering the entire sky."[4] The traditional view that Heraclitus' souls come from water proves wrong: B 36 says that while human souls perish into water, water itself is continually transformed into soul-exhalation that forms the soul of the world and not individual souls. Significantly, this reading avoids the inconsistency which otherwise exists between B 36 and Macrobius' report on the heavenly origin of our soul.

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[4] ἔστιν ὕδωρ ψυχῇ [Sylburg, ψυχὴ cod.] θάνατος †δ' ὑδάτεσ<σ>ιν ἀμοιβή, † [ἀμοιβή secl. Bywater: χὐδάτεσσι δὲ γαῖα Marcovich, acc. Bernabé] | ἐκ δὲ ὕδατος <πέλε> [suppl. West *EGPhO* 150] γαῖα, τὸ δ' ἐκ γαίας πάλιν ὕδωρ | ἐκ τοῦ δὴ ψυχὴ ὅλον αἰθέρα ἀλλάσσουσα [cod. : αἰθέρ' ἀναΐσσουσα Bywater]. The verb ἀλλάσσω principally means "make different, change, alter," hence also "change position," i. e., "go to a place" (LSJ, *s.v.* iii.2). M. L. West, *The Orphic Poems* (Oxford 1983) 223, translates "transferring to the universal *aether*," and A. Bernabé, *Textos órficos* (Madrid 2004) 61, "which turns into the universal *aether*." These translations practically yield the same sense of "altering the entire

Thus, Macrobius' "stellar essence" is the bright and dry soul-exhalation gathered and set aflame in the bowls of the stars, which are the heavenly bodies most distant from the earth. It follows that our soul is a bit of the bright soul-exhalation, in effect a particle of the divine soul, which comes from the farthest region of the heavens. And indeed, if bright exhalation is the soul substance, it must be the substance of the divine and the human soul alike, which, as Aëtius 4.3.12 (= DK 22 A 15) tells us, are "of the same kind."

The soul of the world is divine by virtue of its physical nature, i. e., just because it is the dry fiery-airy body; consequently, if the human soul is physically akin to the divine, it too must be divine. I turn now to B 119, which has come down to us in three versions:

(i) Stobaeus *Ecl.* 4.40.23: ἦθος ἀνθρώπῳ δαίμων.
(ii) Plutarch *Quaest. Plat.* 999D-E: ἦθος ἀνθρώπου δαίμων.
(iii) Alexander *De fato* 170.18 (= *De an.* 2.185.23): ἦθος ἀνθρώπων δαίμων.

Diels preferred Stobaeus' ἀνθρώπῳ and G. Bernardakis[5] emended Plutarch's ἀνθρώπου by the analogy of Stobaeus. However, as Cherniss[6] pointed out, Plutarch's genitive is supported by Alexander's ἀνθρώπων; a genitive form, probably Plutarch's singular, appears to be a superior reading.[7] Considering that elsewhere in Heraclitus ἦθος means "nature" (B 78: "For the human nature has no insight but the divine does"), the preferred translation of the word in B 119 is "nature, (non-moral) character."[8] This, in turn, renders the traditional translation of δαίμων as

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sky" ("changing the whole *aether*," C. Osborne, *Rethinking Early Greek Philosophy* (Ithaca 1987) 6: in being exhaled from water, soul either alters (in effect forms) the entire heavens or joins them.

[5] *Plutarchi Moralia*, Bibliotheca Teubneriana, 1888–96.

[6] In the Loeb edition of Plutarch's *Moralia*, 13.1, 20 n 2.

[7] Cf. J. Bollack and H. Wismann, *Héraclite* (Paris 1972) 328.

[8] This is the sense in which ἦθος occurs in Empedocles B 17.28 and probably in B 110.5. In Herodotus, the word never means "moral character," "disposition," or the like; see J. E. Powell, *A Lexicon to Herodotus*, *s.v.* ἤθεα. In Plato, *Crit.* 120D-121B the opposition τὸ δὲ ἀνθρώπινον ἦθος:ἡ τοῦ θεοῦ φύσις indi-

"fate" irrelevant, the required sense being "god, divine being, demigod." This is precisely how Plutarch *Quaest. Plat.* 999D-E understands Heraclitus' statement:

> Is it then his own nature (φύσις), as more discerning than productive, that he [*sc.* Socrates] called god (θεόν), just as Menander said "For our mind (νοῦς) is the god" and Heraclitus said "Man's nature (ἦθος) is a δαίμων."

Heraclitus' idea of the human being, then, is basically the same as that of Empedocles', who imagined man as a δαίμων dressed "in an alien robe of flesh" (B 126).

As we recall, Aëtius says that according to Heraclitus our soul is made of two exhalations, the external and the internal. The connection of our soul with external exhalation is explained in Sextus *Adv. math.* 7.127–130:

> …[T]hat which encompasses us (τὸ περιέχον ἡμᾶς) is rational and sane… (129) By having drawn in this divine reason (λόγος) through breathing we, according to Heraclitus, become endowed with a mind[9] … In sleep… the mind that is in us is separated from its union with the encompassing (τὸ περιέχον) – the only attachment preserved being that by breathing as if by a root… (130) But on awakening, having peeped through the sensory passages as through a sort of windows once again and come in contact with the encompassing, it becomes invested with the power of reason once again … [T]he portion of the encompassing hosted in our bodies… by the union (with the encompassing)… is made like in kind with the whole (of it).

H. Diels *DG* 210–11 argued that since Sextus says that we breathe in the encompassing λόγος, and since what we actually breathe in is air, the λόγος, and therefore the principle itself, must be air; this, as we learn from Sextus *Adv. math.* 10.233, is Aenesidemus' interpretation. As I have suggested above, however, since in Heraclitus the atmospheric air must be part of dry exhalation, the latter is the substance we breathe.

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cates the synonymy of ἦθος and φύσις, a sense quite frequent in Galen (e.g., at 11.9.1: τὸ ἦθος τοῦ πυρετοῦ). Note further Pindar's affirmation that neither fox nor lion will ever change its ἐμφυὲς ἦθος (*O.* 11.19–20; cf. συγγενὲς ἦθος in *O.* 13.13). On the early uses of ἦθος see S. M. Darcus, "*Daimon* as a force in shaping *ethos* in Heraclitus," *Phoenix*, 27 (1974) 391–94 (although I cannot follow her interpretation of Theognis, 963–70).

[9] νοεροὶ γινόμεθα. The translation "endowed with a mind" is suggested by the correlation between νοεροὶ γινόμεθα as a result of our having drawn in the encompassing λόγος and the subsequent account of the states of ὁ ἐν ἡμῖν νοῦς, "the mind that is in us"; cf. R. Polito, *The Sceptical Road* (Leiden 2004) 153.

This makes the second premise of Diels' reasoning unnecessary. Nor is it for nothing that in his report Sextus nowhere mentions air. In this connection I propose to consider the following passage of Aristotle (*de An.* 411a7):

> Some say that it [*sc.* soul] is intermingled in the whole universe… This presents some difficulties: why does the soul when it resides in air or fire not form an animal, while it does so when it resides in mixture of the elements, and that although it is held to be better when contained in the former? One might ask also, for which reason the soul in air should be better and more immortal than that in living beings. …[I]t is beyond paradox to say that fire or air is a living being… [T]hey say that it is through the retention of a bit of the encompassing in the living beings that the living beings become animate. But if the air breathed in is the same in kind, while soul is made of different parts, etc.[10]

Aristotle's last sentence makes it clear that the retention of "a bit of the encompassing" is through breathing. Fire is not a convenient example of a breathable substance yet Aristotle repeatedly mentions it along with air.[11] This indicates that Aristotle has in mind a particular thinker (or thinkers) who believed that soul resided in fire, that it formed the breathable "encompassing," and that animals became animate by inhaling this soul substance, which Aristotle, like Sextus, calls "the encompassing." Aristotle knows of two thinkers, Heraclitus and Hippasus, who posited fire as the principle. This leaves us with a choice: to admit that Aristotle's passage supports the core of Sextus' account, or to wonder why it should not be Hippasus, and him alone, whom Aristotle has in mind.[12]

An "intelligent" and "rational" substance which we breathe in and which Aristotle and Sextus call "the encompassing" must be the same as Aëtius' exhalation which is outside us, i. e. the soul of the world. Sextus' statement "by having drawn in this divine reason through breathing we, according to Heraclitus, become endowed with a mind" suggests that the mind, a particle of the intelligent encompassing which is "hosted in our bodies," enters us with our first breath. From Numenius (fr. 30 des Places) we learn what happens to souls on entering the body:

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[10] J.A. Smith's translation with minor changes.

[11] From which H. Cherniss *ACPPh* 309 n. 72 infers that Aristotle is thinking of Diogenes and Heraclitus.

[12] Another lesson of Aristotle's passage is that the Stoic conception of the human soul as "a particle" (ἀπόσπασμα) of the divine traces back to the Presocratic thinkers. The scholarly view of Aëtius' report on the cosmic soul in Heraclitus as a Stoic misattribution is therefore unwarranted.

> …Heraclitus said that "For souls it is pleasure or[13] death to become wet" [B 77] and that pleasure for them is falling into birth.

In "falling into birth" the soul becomes wet, evidently as a result of its attachment to the body. The internal exhalation which, according to Aëtius, is another constituent of our soul along with the dry exhalation from outside, is thus the wet exhalation of the body. The soul is νοερά, because it is a particle of the intelligent soul-exhalation and for this reason it is best when it is most like it: "A dry radiance: soul is wisest and best" (B 118). In becoming wet the soul grows different from the soul substance, becoming, so to speak, less soul. As we learn from B 117, wetness disrupts the soul's activity: "A man when he is drunk is led by a beardless boy, stumbling, not perceiving whither he goes, having his soul wet"; and if the wetting impact of the body is unchecked, the soul eventually perishes, turning into water (B 36). As the wetness of the body damages the soul, Heraclitus figuratively portrays mortal life as the soul's death. Clement *Strom.* 3.3.21.1, 5.14.105.2 tells us that "Heraclitus calls birth death" and that, according to him, "the path of the soul into the body is sleep and death.".[14] This is how Philo and Sextus expound the meaning of B 62 and B 88, respectively; I run their explanations parallel to Plato, *Gorgias* 492E-493A:

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[13] ἤ Diels, μή codd., see below, n 17.

[14] Plut. *de Is.* 362A-B: "And indeed, because the natural philosopher Heraclitus says that 'Hades is the same as Dionysus in whose honour they rave and celebrate Bacchic rites' [B 15], people reach this same opinion. For those who believe that the body is called Hades of the soul, as if the soul is deranged and intoxicated in it, draw a close allegory." As O. Gruppe, *Die griechischen Culte und Mythen* (Leipzig 1887) 1.649, observed, Plutarch's passage evinces Heraclitus' belief that while in the body the soul is, as it were, inebriated and dead.

	Philo, *Leg. alleg.* 1.108.1–5:	**Sext. *Pyrrh. hyp.* 3.230:**	**Plato, *Gorg.* 492E-493A:**
1.	For he [*sc.* Heraclitus] says: “We live their death, die their life” [B 62]	But Heraclitus says that	
2.		life and death are in us both when we live and when we die [B 88]:	
3.			I should not be surprised, if Euripides was right when he said: “Who knows, is not to live to be dead, and to be dead to live?” [fr. 638 Kannicht]. – And we, in truth, are perhaps dead. For I myself already heard one of the wise men saying that
4.	since now, when we live, the soul is dead and is buried in the body as in a tomb; but if we be dead, the soul would live the life of its own…	for when we live, our souls are dead and buried in us, while when we die our souls return to life and live	we are now dead and the body is to us a tomb,
5.			whereas that part of the soul in which the desires reside happens to be prone to seduction and travels up and down.[15]

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[15]

	Philo, *Leg. alleg.* 1.108.2–5:	**Sext. *Pyrrh. hyp.* 3.230.2–6:**	**Plato, *Gorg.* 492E-93A:**
1.	φησὶ γὰρ [sc. Heraclitus]· “Ζῶμεν τὸν ἐκείνων θάνατον, τεθνήκαμεν δὲ τὸν ἐκείνων βίον” [B 62]	ὁ δὲ Ἡράκλειτός φησιν,	
2.		ὅτι καὶ τὸ ζῆν καὶ τὸ ἀποθανεῖν καὶ ἐν τῷ ζῆν ἡμᾶς ἐστι καὶ ἐν τῷ τεθνάναι [B 88]	
3.			οὐ γάρ τοι θαυμάζοιμ’ ἂν εἰ Εὐριπίδης ἀληθῆ ἐν τοῖσδε λέγει, λέγων— τίς δ’ οἶδεν, εἰ τὸ ζῆν μέν ἐστι κατθανεῖν, τὸ κατθανεῖν δὲ ζῆν; καὶ ἡμεῖς τῷ ὄντι ἴσως τέθναμεν· ἤδη γάρ του ἔγωγε καὶ ἤκουσα τῶν σοφῶν
4.	ὡς νῦν μέν, ὅτε ζῶμεν, τεθνηκυίας τῆς ψυχῆς καὶ ὡς ἂν ἐν σήματι τῷ σώματι ἐντετυμβευμένης, εἰ δὲ ἀποθάνοιμεν τῆς ψυχῆς ζώσης τὸν ἴδιον βίον, κτλ	ὅτε μὲν γὰρ ἡμεῖς ζῶμεν, τὰς ψυχὰς ἡμῶν τεθνάναι καὶ ἐν ἡμῖν τεθάφθαι, ὅτε δὲ ἡμεῖς ἀποθνῄσκομεν, τὰς ψυχὰς ἀναβιοῦν καὶ ζῆν.	ὡς νῦν ἡμεῖς τέθναμεν καὶ τὸ μὲν σῶμά ἐστιν ἡμῖν σῆμα,
5.			τῆς δὲ ψυχῆς τοῦτο ἐν ᾧ ἐπιθυμίαι εἰσὶ τυγχάνει ὂν οἷον ἀναπείθεσθαι καὶ μεταπίπτειν ἄνω κάτω.

It is evident that Euripides' verses, which Plato has Socrates cite, draw on Heraclitus. In (4) verbal parallels in the three independent sources suggest a paraphrase of Heraclitus, which authenticates Philo's and Sextus' explanation of Heraclitus' meaning in B 62 and B 88. Plato's "that part of the soul in which the desires reside" is of course his own, but his "travels up and down" validates the report of Iamblichus (*ap.* Stob. i 49, 39.40) and Aeneas of Gaza (*Theophr.* 5.12) that "Heraclitus posits… the travel of the soul up and down."[16] As Proclus (*in R.* ii 20.23) puts it, presumably elaborating Heraclitus, souls "travel a circular path not only led by the destiny – as the saying goes, 'pastured by blows' [B 11], but also leading themselves."[17]

So in a way, our birth is the death of our soul, and conversely our death amounts to its life: "Immortals are mortal, mortals immortal, living their death, dying their life" (B 62). Because of the double, literal and figurative, meaning of "life" and "death," and of the related "waking" and "sleeping," our soul can be described in both ways: "The same thing is in us living and dead, and awake and sleeping, and young and old" (B 88). As the newborn soul of a mortal creature, it is young, alive, and awake, but as a particle of the divine, it is old, dead, and asleep.[18] It emerges that the famous equation of body (σῶμα) with the soul's tomb (σῆμα) is Heraclitus'. But this is not surprising: the idea is a corollary of his view of incarnation as the soul's "death."[19]

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[16] This report is found in the passages of Iamblichus and Aeneas which run parallel to Plotinus 4.8.1. Since Aeneas' exposition of Heraclitus', Empedocles', and Plato's theories goes beyond that of Plotinus, he must have drawn, not on Plotinus, as is usually assumed, but on a source common to him and Plotinus. Burkert (above, n. 1) suggests that Plotinus' (hence also Aeneas') source was a first-century Alexandrian compilation, used also by Plutarch, Clement, and Hierocles.

[17] As for the transmitted text of B 77 (cf. above, n 13), θάνατον, rejected by E. Zeller, in Zeller-Nestle, *Philosophie der Griechen*^{6}, 1.2.890 n. 2) and I. Bywater, *Heracliti Ephesii Reliquiae* (Oxford 1877), fr. lxxii), followed by Burnet, Gigon, and others, is supported by Numenius' quotation of B 62 next to B 77, Proclus' "as Heraclitus says, 'it is death for souls to become wet' [B 77]" (*in Plat. Res.* 2.270.30), and, most importantly, the paraphrase (4) in the above synoptic table where Heraclitus equates incarnate life with the soul's death. This equation makes it clear that the transmitted τέρψιν μὴ θάνατον must be wrong; one should read, with H. Diels, ἤ (W. Kranz' καί is paleographically less likely). That Porphyry, who borrows here from Numenius, read ἤ (or καί) is indicated by his paraphrase of B 77 (*in Tim.* i, fr. 13.10 Sodano): "…that part of the soul, which is the seat of desire, inundated by the moisture incident to generation is enfeebled and sinks into the flows of matter, and this is another death of intelligent souls, to become wet [B 77], says Heraclitus."

[18] Consequently, the explanation offered in the next, epexegetic clause ("for these having changed round are those, and those having changed round again are

It is evident that if on entering the body the soul, a particle of the dry exhalation, becomes mixed with the wet exhalation, it will quit the body moist. This means that death does not deliver the soul from the impact of bodily wetness.[20] So one would expect to find in Heraclitus the theory that the disembodied soul is encumbered with bodily vestiges, and consequently needs to be purified of the body while still in the body. Such a theory would range with the ascetic and cathartic ideas of the Archaic Age, typified in the Orphic and Pythagorean doctrines of pure life.

"For souls it is pleasure or death to become wet" (B 77). Souls derive delight from the bodily life which costs them their own life: "It is hard to fight against desire, for whatever it wants, it offers to buy at the price of the soul" (B 85).[21] Most men willingly pay this price, living the brutish life of gratifying appetites: "…The many stuff themselves with food, like cattle," while "the best" "prefer one thing over anything else, ever-

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these") is quite irrelevant, and U. von Wilamowitz proves right, *pace* H. Diels, in rejecting this clause. Besides, even if life and death in Heraclitus are reciprocal, they are such not in one and the same thing, hence not "in us," but between things. As to young and old, these are not reciprocal on any account.

[19] The σῶμα-σῆμα doctrine is usually regarded as Pythagorean and/or Orphic. The former attribution is merely by default, the latter is at odds with Plato's words at *Cratyl.* 400C, as Wilamowitz, *Der Glaube der Hellenen* 2.199 and many others since then have pointed out. (For a recent defence of this attribution see A. Bernabé, "Una etimología Platónica: σῶμα-σῆμα," *Philologus* 139 (1995), esp. 218–23.) Plato's wording is not the only difficulty in assigning the σῶμα-σῆμα doctrine to the Orphics: recent decades have witnessed growing awareness that the sharp dualism of soul and body was not part of the Orphic worldview: A. Boulanger, "Le salut selon l'Orphisme," (Paris 1940) 73; U. Bianchi, "L'Orphisme a existé," in id., *Selected Essays on Gnosticism, Dualism and Mysteriosophy* (Leiden 1978) 190; L. J. Alderink, *Creation and Salvation in Ancient Orphism* (Chico 1981) 62–64, 83, 88–89; G. Casadio, "Adversaria orphica," *Orpheus* 8 (1987) 392; R. Parker, "The Early Orphism," in A. Powell (ed.), *The Greek World.* (London 1995) 499.

[20] Here is the answer to the difficulty raised by P. Tannery, *Pour l'histoire de la science hellène* (Paris 1887) 190: if the difference between the δαίμων before the incarnation and the human soul consists in the impurity of the latter as a result of its association with the body, why did Heraclitus attach importance to our conduct in earthly life, if death restores the soul's purity?

[21] θυμῷ μάχεσθαι χαλεπόν· ὅ γὰρ ἂν θέλῃ, ψυχῆς ὠνεῖται. "Offer to buy, bid" is a usual sense of ὠνέομαι in the present and imperfect (LSJ, *s.v.* 1; J.E. Powell, *Lex. Herod.*, *s.v.* 2), a sense which suits the purport of the statement better than the traditional translation "buys": to fight θυμός is to decline its tempting offers.

lasting glory over mortal things" (B 29). The "everlasting glory" alludes to martial valour which Heraclitus praises in B 24 ("Gods and men honour those slain in battle") and evidently also in B 25 ("Greater deaths win greater destinies"), which Plato (*Cratyl.* 398B) and Theodoretus (*Gr. aff. cur.* viii 39) associate with B 24. Obviously, one who performs feats of bravery and courage, laying down one's life, behaves in a way contrary to gratification of the body.

At *Strom.* 4.4.14.4 Clement reports a theory of "the ancients" on the difference between dying in battle and of disease:

> And the ancients among the Greeks praise the death of those fallen in war… because he who dies in war passes away without fear of dying, cut off from the body, without having suffered sickness in the soul nor slackened, which men undergo in diseases. For they depart in a womanly manner, longing to live on. For these reasons they let their soul go not pure but carrying its appetites with itself, like weights of lead—save those among them who have become renowned for goodness. There are also those who die in war still with their appetites, and with them it would make no difference whatsoever if they had died of disease.
>
> Having set against these ideas his concept of purity as life in the knowledge of God and in agreement with the Commandments, Clement proceeds:
>
> Then Heraclitus says: "Gods and men honor those slain in battle" [B 24] and Plato in the fifth book of the *Republic* [468E-69A] writes: "Of those who die in battle, whoever dies having distinguished himself – shall we not, first of all, say that he is of the Golden race?"

"The ancients among the Greeks" whom Clement has in mind appear to be Heraclitus and Plato. Since Plato never contrasts two kinds of death or otherwise disapproves of death by disease, the theory must be Heraclitus',[22] the more so in that it involves the peculiar idea of the disembodied soul burdened by bodily vestiges. This idea reappears in Plutarch *Rom.* 28.8, who phrases it in distinctly Heraclitean "physical" terms, mentions Heraclitus by the name, and cites B 118:

> …"For this [*sc.* soul] alone is from gods" [Pindar, fr. 131b.2–3 Snell/Maehler], for thence it comes thither it returns, not with the body, but whenever it is most removed and separated from it and becomes completely pure and bare of flesh and holy. For this is a dry and best soul [B 118], according to Heraclitus, darting out of the body like lightning out of a

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[22] As seen by G. Kirk, "Heraclitus and Death in Battle (Fr. 24 D)," *AJP* 70 (1949) 384–393.

> cloud. But a soul mingled with the body[23] and burdened with the body, such as a heavy and misty exhalation, is hard to kindle and to carry upwards.

Clement's and Plutarch's reports converge to produce a comprehensive picture. Although a soul mingled with the body is still the dry exhalation (for otherwise it would not be a soul at all, having perished into water), it is literally fleshy because of an admixture of the wet exhalation of the body and therefore "heavy and misty," "carrying its appetites with itself, like weights of lead" and "is hard to kindle and to carry upwards." To have one's soul pure one should make it "bare of flesh," that is, dry. This can be occasionally achieved through virtuous death in battle, when one dies "without fear of dying, cut off from the body," but otherwise requires extraordinary goodness which consists in one's freeing oneself from the attachment to bodily life. For when soul is "removed and separated of the body," it is "darting out of the body like lightning out of a cloud," altogether free of fear and desire, and therefore easy to kindle and carry upwards.

Both Clement and Plutarch refer to the soul separated from the body and free of appetites as καθαρά, "pure." Heraclitus' talk about the purity and purification is confirmed by Iamblichus *De myst.* 5.15 (= B 69): "There are two kinds of sacrifices: those by men wholly purified (ἀποκεκαθαρμένων παντάπασιν), as sometimes happens, though rarely, to one man, as Heraclitus says," etc. Evidently, the "completely purified" is one whose soul is as pure of the wet admixture as it was before it entered the body. If this is a rare accomplishment, the rest of the souls must be impure in varying degree. As particles of the dry exhalation, souls must become attached to different strata of the soul-exhalation, and the purer they are, the higher they rise. Souls that are "heavy and misty" and "hard to kindle and to carry upwards" must be situated in the mixed, impure region, thus remaining close to the earth. By the same token, a soul which is "completely purified" of wetness, "darting out of the body like lightning out of a cloud," reaches the pure and lucid region of the heaven. Since this is the region of the sun and the stars, arriving there the soul returns thither whence it came, hence recovers its divinity. Incidentally, this sheds light on Heraclitus' puzzling idea of the heavenly bodies as "bowls": these are the abode of fire-like souls which otherwise would merge with the heavenly fire. If the size of the sun is just as we see it ("the width of the human foot"; B 3),[24] the same must be true of the stars, which makes it plausible to suggest that each star is a soul-δαίμων.

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[23] σώματι πεφυρμένη. φύρω = "mix something dry with something wet, mostly with a sense of mixing so as to spoil or defile" (LSJ, *s.v.*).

The conclusion that the pure soul recovers its divinity finds support in B 63 ἔνθα δ' ἐόντι ἐπανίστασθαι καὶ φύλακας γίνεσθαι ἐγερτὶ ζώντων καὶ νεκρῶν. "Before him [*sc.* the god] there they rise and become guardians of those wakefully living and those dead." Hippolytus quotes the fragment to prove Heraclitus' belief in resurrection, and there is little doubt indeed that Heraclitus speaks here of the souls of the dead which "awake" and become tutelary deities. Such deities would normally be called δαίμονες, and in fact Heraclitus, as has been repeatedly observed,[25] draws on Hesiod *Op.* 121–123: "Since the earth covered up this [*sc.* Golden] race, they have been holy δαίμονες … guardians of mortal men."

It emerges that Heraclitus' teaching involved an eschatological conception similar to that of the Orphic-Bacchic gold leaves, burial tablets dating from ca. 400 BC on, discovered throughout the Greek world (West Sicily, Magna Graecia, Crete, Achaea, Elis, Thessaly, Macedonia). The doctrine that appears from these inscriptions can be summarized as follows: the soul is of divine origin; having kept pure during life on earth, it breaks away from the grievous circle of reincarnations[26] and, facing in Hades the decision of Persephone, pleads for deification, which is granted: "You will be god instead of mortal."[27] Similarly in Empedocles B 112.4: "I, an immortal god in your eyes, no longer mortal." Given the divine origin of the soul, deification—in the gold leaves and in Empedocles alike—is the soul's homecoming.

Heraclitus' doctrine shows the same pattern of belief – the divine origin of the soul, the circle of births, pure life as the agent of salvation, and the final return and deification. To recall Sextus' paraphrase of Heraclitus' words (*Pyrrh. hyp.* 3.230): "When we live, our souls are dead and buried in us, while when we die our souls return to life and live"; and since the body is the defiling tomb of the soul, when a soul quits it and rises to life, the dead body is "more fit to be thrown out than dung" (B 96). The inscription on the fifth-century Olbia bone plate (463 T, Bernabé) provides a concise parallel: "Life, death, life. Truth. Dio(nysus). Orphics."[28]

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[24] In the Derveni papyrus (col. 4.7–9) B 3 and B 94 are quoted as a continuous piece. This suggests that the two sayings probably belonged together, in which case B 3 is to be understood literally (cf. D. Sider, "Heraclitus in the Derveni papyrus," in A. Laks, and G. W. Most (eds.), *Studies on the Derveni Papyrus* (Oxford 1997) 139–40).

[25] The first time by J. Bernays, *Gesammelte Abhandlungen* (Berlin 1885) 1.324–25.

[26] The gold plate from Thurii (from Timpone piccolo, 488.5 F Bernabé): "I flew away from a deeply grievous and painful circle" (κύκλου δ' ἐξέπταν βαρυπενθέος ἀργαλέοιο; cf. Empedocles B 115.8: ἀργαλέας βιότοιο μεταλλάσσοντα κελεύθους, "changing painful paths of life").

[27] 487.4 F; cf. 491.4 F Bernabé.

Given the state of our evidence, it seems wise not to attempt a detailed comparison of Pythagoras eschatological ideas with those of Heraclitus. The typological coincidences between Heraclitus' eschatology and the Orphic doctrine as represented in the gold leaves prove thorough and systematic; it therefore seems justified to infer a similar relation between Heraclitus' and Pythagoras' teachings. But although similar typologically, these doctrines of course differ in the way they moulded the shared eschatological beliefs. These differences may seem secondary to us, but they were undoubtedly of paramount significance for the proponents of these doctrines. Heraclitus deemed Pythagoras "the head of cheats" (B 81) and threatened the initiates and bacchants—apparently the partisans of beliefs similar to those attested in the gold leaves—with punishment for their impiety (B 14; cf. B 15).

Diogenes 9.6 (= DK A 1) tells us that "Heraclitus' book won such great fame that devotees of his arose, called 'Heracliteans'." There is no suggestion in the report that the recognition was posthumous;[29] in all likelihood, Heraclitus, like Pythagoras, was a renowned teacher of wisdom. Heraclitus condemned Pythagoras as "the head of cheats" (B 81) and called his wisdom "artful knavery" (B 129). This clearly distinguishes Pythagoras from other victims of Heraclitus' abuse whom he censured as silly, ignorant, and unworthy of their high reputation, but never as dishonest (A 22; B 40, B 42, B 56, B 57). As Pythagoras was famous for his doctrine of metempsychosis—cf. Xenophanes B 7—Heraclitus' animus would suggest that eschatological ideas were at the heart of his own teaching. More definite evidence seems to be furnished by Heraclitus' literary style which compares well with the antithetic language of the Orphic bone plates from Olbia (463–465 T Bernabé) and the *legomena* of the Eleusinian mysteries (of which, incidentally, he was hereditary priest, as follows from Strabo, 14.1.3).[30] If Heraclitus chose this language to communicate his entire teaching, it seems hard to avoid the conclusion that eschatology was its hub.

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[28] ΟΡΦΙΚΟΙ was read by A. Rusyaeva, "Orfism i kult Dionisa v Olvii," *VDI* (1978, no. 1) 87–88, and, on a re-examination of the inscription, by J. Vinogradov, "Zur sachlichen und geschichtlichen Deutung der Orphiker-Plättchen von Olbia," in P. Borgeaud (ed.), *Orphisme et Orphée: en l'honneur de Jean Rudhardt* (Geneva 1991) 81.

[29] τοσαύτην δὲ δόξαν ἔσχε τὸ σύγγραμμα, ὥς καὶ αἱρετιστὰς ἀπ' αὐτοῦ γενέσθαι τοὺς κληθέντας Ἡρακλειτείους. The sense "founder of a philosophical school" of αἱρετιστής, which LSJ suggests here, is otherwise unattested (the reference to *Vita Philonidis* is a printing error corrected in the Revised Supplement) and evidently is admitted to suit the presumption that Heraclitus won no recognition in his life-time.

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[30] The similarity of Heraclitus' style to liturgical formulae of the mysteries was discussed by G. Thomson, "From religion to philosophy," *JHS* 73 (1953) 79, 83, who labelled Heraclitus' language "hieratic." The Derveni papyrus appears to support Thomson's observation: in col. 4.6 Heraclitus seems to be referred to as speaking like one who relates a sacred discourse: ὅσπερ ἴκελα ἱερολόγω̣ (cf. col. 7.7). Proposed by D. Sider (above, n. 24) 135, this restoration is adopted in R. Janko, "The Derveni papyrus: an interim text," *ZPE* 141 (2002) 8, and G. Betegh, *The Derveni Papyrus* (Cambridge 2004) 10. Alternative restorations are μυθολόγω̣, φυσιολόγω̣, and ἀστρολόγω̣.

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6. Early Natural Theology

The Purification of the Divine Nature

Herbert Granger

Aristotle, who provides us with one of our major sources of information on the Presocratic philosophers, dubbed them *physiologoi*, "natural philosophers," because he took them to be devoted above all else to the study of nature after the fashion of his own inquiry into the natural world.[1] These new intellectuals of the sixth and fifth century did speculate about the full range of natural phenomena. The earliest of them, Thales, Anaximander, and Anaximenes of Miletus, took up a study of astronomy, meteorology, seismology, zoögony, anthropogony, and, not least of all, cosmogony. Aristotle's student Theophrastus and the doxographical tradition he founded followed Aristotle's lead in characterizing the Presocratic philosophers as largely students of nature, and this characterization has dominated their depiction throughout our history. There is, however, good reason for thinking that the Aristotelian tradition distorts the enterprise of the Presocratic philosophers of the sixth century. These earliest of philosophers are as much "natural theologians" as they are "natural philosophers."[2] They undertook a radical reform of the Greek conception of divinity, as well as a reformulation of the Greek understanding of nature. The theology of the early Greek philosophers goes hand-in-hand with their physics, since they had inherited a conception of divinity and nature that intertwines the two, and thus the study of the one topic brings along the other. These new intellectuals, however, may have undertaken their study of the natural world so that they may reach a better understanding of the divine nature. Indeed, if they are taken to be "theologians," rather than nascent "physicists," it is easier to make a case for them as the founders of philosophy, as we have come to understand it.[3] Those who seek the essence of divinity have more in common with philosophers, who engage in *a*

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[1] The references to Hecataeus are those of F. Jacoby, *Die Fragmente der griechischen Historiker*, vol. 1 (Leiden 1957). The author is responsible for the translations, although a heavy debt is owed to the translations of Heraclitus by C. H. Kahn and to those of Xenophanes by J. H. Lesher.

[2] In contrast with F. M. Cornford's enthusiasm for a connection between mythology and Ionian natural philosophy, *From Religion to Philosophy* (London 1912), J. Burnet, *Early Greek Philosophy*^{4} (London 1930) 13–15, argues for the independence of Milesian thought from "theological speculation" and for the "secular character of the earliest Ionian philosophy." The Ionian natural philosophers had purged their use of *theos* of its religious significance, which "always means first and foremost an object of worship," and these natural philosophers used "god" only to indicate the eternity of their first principle, as what is merely "ageless" and "immortal." Burnet contends that this non-religious sense of *theos* already exists in Hesiod, who introduces gods no one would worship, which are "mere personifications of natural phenomena, or even of human passions."

W. Jaeger, *The Theology of the Early Greek Philosophers* (Oxford 1947), argues against Burnet, without pressing the target of his criticism, for the serious theological enterprise of the early natural philosophers. G. Vlastos, "Theology and philosophy in early Greek thought," *PQ* 2 (1952) 97-123, in his criticism of Jaeger, in effect favors Burnet's thesis. The early natural philosophers, according to Vlastos, are not "philosophical" theologians, since their divinity provides no justification for cult practices of any sort. Pythagoras, however, is a genuine philosophical theologian, since he established a cult for his followers, which is based upon his religious beliefs. The natural philosophers in effect assimilate nature and divinity by attributing the divine features of traditional religion to nature, and "their primary object is to understand nature, not to reform religion." Contrary to Aristotle's report, Vlastos argues that Anaximander never used the word *theos* or *theion* for a description of the *apeiron* (n. 75). See Guthrie, *HGP* 1.89 n. 1 for convincing arguments against Vlastos and in favor of Anaximander's use of *theion.* J. Barnes, *The Presocratic Philosophers* (London 1979) 1.99, has no appreciation of the theological dimension of the Milesians, who, he contends, pay merely "lip-service" to divinity; whereas W. Burkert, *Greek Religion* (Cambridge, Mass. 1985) 310–311, portrays the philosophers of the sixth century as engaged in serious theological activity. They did not act with impiety when they broke with traditional religion, but in the expectation that a better understanding of "reality" would yield a better understanding of divinity.

[3] K. Algra, "The Beginnings of cosmology," in A. A. Long (ed.), *The Cambridge Companion to Early Greek Philosophy* (Cambridge 1999) 45-65, illustrates the difficulty of classifying the natural philosophers. He has argued that the Milesians are neither "philosophical" in the modern sense nor strictly "scientific" in either the Baconian or Popperian rendition of "science," and that they may best be appreciated as "protoscientists" who stood upon the threshold of that part of ancient philosophy that came to be known as "physics." P. Curd, "The Presocratics as philosophers," in A. Laks and C. Louguet (eds.), *Qu'est-ce que la philosophie présocratique?* (Villeneuve d'Ascq 2002) 115-138, does not do much better for the status of the Milesians as "philosophers" when she defends what she regards in its fundamentals as the "traditional interpretation" of the Presocratic philosophers as systematic thinkers who engaged in "rational inquiry."

priori speculation, than those who undertake a physicalist enterprise that intrinsically demands the backing of empirical verification. These theologians may be counted as "natural theologians," since they call upon no Muse and depend on no divine revelation or sacred text. They depend upon their own human capacities for their theological speculation, while remaining under the influence of significant presumptions within conventional religious belief. These natural theologians of the sixth century divide in their thinking between those who postulate a transcendent divinity beyond the range of full human comprehension, and who, like Hesiod, place a mystery behind the cosmos, and those theologians who postulate an immanent divinity accessible to human apprehension. In the fifth century immanent theism gains the upper hand, and it is not until the fourth century that transcendent theism reëmerges in a vigorous way in the theology of Plato, whose creator god, the Demiurge, stands outside the cosmos it creates, just as the Forms of Plato's metaphysics are beyond space and time. Aristotle follows Plato in locating the primary deity of his theology outside nature.[4] The thought of Plato and Aristotle eventually joins that of the ancient Hebrews, and together they issue in the divine transcendence that dominates religious belief to this day in the West and in the Islamic East.

The early Presocratic thinkers were hardly alone in their reëvaluation of theology. Their reform is the expression of the dissatisfaction of just one group, among a number of dissatisfied groups in the sixth century, with the religious tradition shaped by the *Theogony* of Hesiod and the poems of Homer. The theocosmogony of the theologian Pherecydes of Syros, who wrote just before the earliest authors in natural philosophy, makes it evident that these earliest of *physiologoi* do not stand alone in trying to replace the theogony of Hesiod with a new conception of the relation between divinity and nature. Pherecydes lays down a trinity of eternal deities, Zas, Chronos, and Chthoniê, at the foundation of reality (B 1). The god Zas takes on for the first time in surviving Greek literature the role of a creator of the cosmos. This god weaves a robe upon which he embroiders the visible features of earth, including the ocean that surrounds the earth, and he gives this robe to his divine bride, Chthoniê, as her wedding present (B 2). When she dons the cartographical robe she assumes the name Gê, a common name for the goddess "Earth" (B 1), and the familiar earth of our cosmos takes form with the goddess as its divine substructure. The pseudonymous Orphic poets provide another important set of actors in this broad reaction against Hesiod, and they, like Pherecydes, devise theocosmogonies with their own demiurgic dimension.[5] All these authors in their reform give a prominent place to theogony or theocosmogony in their expositions, probably because the traditional pattern Hesiod follows and strongly reaffirms locates the essence of the gods in their birth and heritage and in their positions in the world-order. The discovery of the Derveni papyrus scroll in 1962 makes it possible for classical scholars to date the earliest Orphic poems within the sixth century and closer to the time of Pherecydes.[6] There is a broad discontent with the theological tradition, and it draws together Pherecydes, the Orphic authors, the Pythagoreans, and the sixth-century *physiologoi*.[7]

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[4] Plato and Aristotle place their major deity beyond the natural world, although Plato applies the word *theos* generously and speaks of other deities within the natural world, such as the heavenly bodies, and even the earth (*Ti.* 40b-c). Aristotle's views upon divinity are less certain across his career. In his lost *De philosophia* he credits the stars with divinity (Cic. *De nat. deor.* 2.15.42, cf. *Metaph.* 1074a38-b10), and in *Cael.* 1.9 he describes the sphere of the fixed stars, which is in eternal circular motion, as "the first and highest divinity" (279a32-b3). When he made this statement, Aristotle had not yet presumably arrived at his idea of the transcendent unmoved mover.

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[5] For Orphism, see W. Burkert, *Lore and Science in Ancient Pythagoreanism* (Cambridge, Mass. 1972); M. L. West, *The Orphic Poems* (Oxford 1983); W. K. C. Guthrie, *Orpheus and Greek Religion*^{2} (London 1952); id. *The Greeks and their Gods*^{2} (Boston 1954); I. M. Linforth, *The Arts of Orpheus* (Berkeley 1941). An excellent summary is provided by R. Parker, "Early Orphism," in A. Powell (ed.), *The Greek World* (London 1995) 483-510.

[6] The Derveni papyrus is the remains of a commentary by an unknown commentator upon an Orphic theogony, of which some nineteen verses of the poem the commentator quotes. The date of the commentary is put at around the last quarter of the fifth century. Parker (above, n. 5) 484 suggests that the Derveni papyrus makes it plausible that the earliest Orphic poems may be from the second half of the sixth century, whereas H. S. Schibli, *Pherekydes of Syros* (Oxford 1990) 35-36, believes that the "main doctrines" of Orphism may now be placed at least closer to the middle of the sixth century, at around the time Pherecydes composed his book. The text of the Derveni papyrus remains unsettled, however. The best text for the moment is T. Kouremenos, G. M. Parássoglou, and K. Tsantsanoglou, *The Derveni Papyrus* (Florence 2006), for a review of which, see R. Janko, *BMCR* 2006.10.29. There is a helpful collection of essays on the papyrus, edited by A. Laks and G. Most, *Studies on the Derveni Papyrus* (Oxford 1997), and R. Janko provides a significant supplement, "The Derveni Papyrus (Diagoras of Melos, *Apopyrgizontes Logoi?*): A new translation," *CP* 96 (2001) 1-32. For additional important work on the papyrus, see West *Orphic Poems* (above, n. 5) 75-101 and G. Betegh, *The Derveni Papyrus: Cosmology, Theology, and Interpretation* (Cambridge 2004).

In the sixth century the authority of the traditional poets was losing its grip upon sophisticated imaginations for the reasons Hecataeus of Miletus lays down in the proem of his *Genealogiai*, which is his inquiry into the ancestry of the descendants of Heracles and Deucalion. Homer and Hesiod had opened their great epics with an expression of their dependence for their knowledge upon the Muses. Left to themselves humans know nothing and must rely upon "rumor" (*Il.* 2.486) for their opinions about the great events in their history and about divinity. Hecataeus challenges this poetic pessimism by opening his prose book with a proud declaration of his epistemic autonomy. He takes credit for what he writes, and he dismisses the "stories of the Greeks" because they are "many" and "absurd" (F 1a). Hecataeus, whom Strabo identifies as a student of Anaximander (14.1.7), finds the stories of the poets incredible because they provide conflicting versions of the same events, but what is more significant because the stories are in many cases just incredible in themselves. Hecataeus finds Homer's story of Heracles' abduction of Cerberus unworthy of belief (*Il.* 8.366–368), and he explains it away as nothing more than Heracles' capture of a snake that had come to be called, "the dog of Hades," because of its deadly bite (F 27, cf. F 25). Hecataeus does not lay down his opinions about the heroes dogmatically, but he conjectures "as it seems to me to be true," and proposes what he takes to be the probable truth of the matter.[8]

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[7] Some scholars think that Aristophanes' depiction of Ionian science in the *Clouds* provides evidence for the theological preoccupation of the natural philosophers. C. H. Kahn, *Anaximander and the Origins of Greek Cosmology* (New York 1960) 106-109, holds that the "elaborate parallel" Aristophanes develops with the "rites of initiation" could not be merely an "empty farce." Belief in the old gods is no longer tenable because they have been pushed aside by "finer and truer divinities" (*Nu.* 247-248, 367). R. Janko, "The Physicist as hierophant: Aristophanes, Socrates and the authorship of the Derveni Papyrus," *ZPE* 118 (1997) 69-70, stresses the hierophantic qualities of the Ionian philosopher portrayed in the *Clouds* as evidence that some of the natural philosophers presented "themselves in the language of the hierophant and the *magus*". Janko also maintains that P. Kingsley, *Ancient Philosophy, Mystery and Magic: Empedocles and the Pythagorean Tradition* (Oxford 1995), esp. at 217-232, has forced scholars to take seriously Empedocles as a hierophant who initiates his audience into sacred mysteries.

[8] Hecataeus is hardly a consistent rationalist, since he is willing to condone outrageous stories: e. g., a talking ram (F 17); the Ethiopian tribe of the Σκιάποδες,

The credibility of the poets was judged lacking over two independent issues. In the one case, the poetic tradition does not provide a sufficiently convincing portrayal of divinity. The Presocratic philosophers in their reëvaluations of divinity offer a reassessment that assigns it a more stately position in the cosmos or beyond. In the other case, the poetic tradition offers dismal prospects for humans after death. Homer envisions for human souls an impoverished half-life shorn of most human qualities, and Hesiod offers nothing better for the mass of humanity. The pseudonymous Orphic poets devise theocosmogonies that provide for the survival of human conscious personality within a framework of metempsychosis, and under the tutelage of certain deities the soul may achieve release from the cycle of birth and death and find eternal bliss in its deification. Orphism and related forms of spiritualism depend upon rites of initiation and make demands upon the individual's behavior, which in the case of dietary restrictions come in direct conflict with traditional cult sacrificial practices.[9] The thinking of the historical Pythagoras, whose career as a teacher of esoteric doctrines spanned the second half of the sixth century, is more in keeping with Orphic beliefs, from what may be gathered from the *akousmata* credited to him and from the testimonial record.[10] The Orphic poets, however, are infamous

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who would lie upon their back and raise their feet above them so that they may shade themselves from the sun (F 327).

[9] Plato reports that the Orphics prohibited the consumption of any animal flesh, and for sacrifices they made do with cakes of meal and grain soaked in honey (*Lg*. 782c-d). The Pythagoreans were more liberal and allowed the consumption of sacrificial beasts (Iamb. *VP* 82).

[10] Our knowledge of early Orphism and the early Pythagoreans is slim, although there is good reason to believe that they have some large-scale features in common. The followers of Orpheus, like those of Pythagoras, took a strong interest in rituals of purification (Plato *R*. 364b-365a). The Orphics, like the Pythagoreans, held to strict dietary regulations, although they were more demanding than the Pythagoreans, since they upheld a complete prohibition on the consumption of animal flesh (Plato *Lg*. 782c-d, Eur. *Hipp*. 952-954, and Aristoph. *Ra*. 1032); see Burkert *L&S* (above, n. 5) 180-183; they also held to some prohibition on beans (Pausanias 1.37.4; cf. 8.15.3-4). But, what is especially significant, the followers of Orpheus probably advocated metempsychosis (Arist. *de An*. 410b28-30, Plato *Cra*. 400b-c, cf. *Phd*. 62b, 70c, *Ep*. vii 335a, *Lg*. 870d-e); see Burkert *L&S* (above, n. 5) 126, 133. The rhapsodic theogony indicates that metempsychosis is a feature of later Orphism (F 338-9 Bernabé); see also Guthrie *Orpheus* (above, n. 8) 182-187; Parker (above, n. 5) 500. Burkert (above, n. 5) 131-132 believes that the oldest sources do not indicate any difference between Orphic and early Pythagorean doctrines, although he believes

for their lurid renditions of divine behavior, which easily compete in gruesomeness with the tales of Hesiod. Isocrates says of Orpheus that he "told stories about the gods such as no one would dare to tell about their enemies … eating of children and castrating of fathers and fettering of mothers" (*Busiris* 38 [A 14b]). Pherecydes also offers an improved eschatology for humanity in his sponsorship of an eternal soul that undergoes transmigration and reincarnation, and Porphyry tells us that Pherecydes' cosmos favors the soul's comings and goings with "nooks and holes and caves and doors and gates" through which souls pass in their "births and deaths" (*Antr.* 31 [B 6]). Yet Pherecydes should not be counted among the Orphic authors. His stories of the gods are too mild for the Orphic imagination, and, in likeness with the Presocratic philosophers' reformulation of the divine nature, he refashions the gods with respectable reputations.

The concern over divine dignity appears most vividly in the fragments of Xenophanes of Colophon, who is a contemporary of Anaximenes and Hecataeus, but who lived well into the fifth century. Despite his belief in multiple gods, Xenophanes makes nothing of polytheism and gives his attention to the "One god among gods and men greatest" (B 23). Xenophanes develops his idea of the divine nature in accord with moral criteria, and he complains that Homer and Hesiod credit the gods with behavior that "among men is a reproach and a disgrace: thieving, adultery, and deceiving one another" (B 11). The Greeks had reached a level of moral discernment that did not permit the ethically astute, like Xenophanes, to find credible any longer the poets' stories of the immoral behavior of the gods. Xenophanes, however, does not reach beyond the traditional ideas of the Greeks for the fundamental features of the divine nature. Rather, he improves upon the defects in the Homeric and Hesiodic conception, which at its heart upholds the goodness and power of the divine nature.[11] The supreme god Zeus is

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that the Orphics and Pythagoreans differed in their history and social circumstances. Guthrie, *Greeks* (above, n. 5) 311 n. 3 also does not think that Orphic and Pythagorean religious beliefs may be separated, but he argues against the suggestion that the followers of Orpheus were from the lower classes (326-332).

[11] No full-blown arguments for the nature of divinity survive in Xenophanes' remains. Jaeger (above, n. 2) 49 says of Xenophanes' opinions on divinity that they are not "really philosophical" or based on "logical proof," but arise "from an immediate sense of awe at the sublimity of the Divine." J. H. Lesher's view amounts to Jaeger's: *Xenophanes of Colophon: Fragments* (Toronto 1992). Xenophanes' opinions upon the divine nature in B 23-26 are "all dogma and

the "best of the gods and the greatest in strength," φέρτατός ἐστι θεῶν κάρτει τε μέγιστος (Hes. *Th.* 49). Even though Xenophanes writes in verse, he calls upon no Muse for his authority. Instead, he offers a sharper analysis of the nature of divinity, as he finds it in the poetic tradition, and he formulates no proof of the "greatest" god's existence, which he takes for granted, just as the Milesians do not undertake a proof of the existence of their divine first principle.

When Xenophanes analyzes the traditional divine superiority in goodness and in power, he finds the true nature of these features to be often at odds with their poetic depictions. The tradition is riddled with inconsistencies and inadequate renderings of divine properties. Its depiction of the gods is incoherent when it maintains that the gods are "the deathless ones always existing," ἀθανάτων … αἰὲν ἐόντων (Hes. *Th.* 21, *Il.* 1.290, 2.400, 3.296), and then insists upon and recounts their birth. Aristotle reports that Xenophanes complains that it is just as "impious" to speak of the birth as it is of the death of the gods (A 12). Xenophanes' theological task is to purify the idea of the gods, and find "pure words" or "purified words" (καθαροὶ λόγοι), with which to honor them (B 1.14). The "greatest" god, as Homer and Hesiod would agree, has exceptional power as an implication of this greatness.[12] Zeus is the most powerful of the gods (ὑπερμενής), and many passages in Homer and Hesiod attest to his and the gods' great power (*Il.* 2.350, *Th.* 534). Zeus can make "great Olympus quake" with the nod of his head, as Homer relates (*Il.* 1.528–530), but Xenophanes improves upon this conception of divine power by maintaining that the greatest god, "without effort shakes all things by the thought of his mind" (B 25). Lesher takes this to be Xenophanes' outright rejection of the Homeric conception of the divine nature, as what can accomplish great acts with little physical effort, and his replacing it with a divinity that is causally efficacious without any physical ef-

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all flat assertion" (116), and Lesher is not sympathetic to the suggestion that Xenophanes' idea of divinity is based upon the Homeric tradition. Instead, Xenophanes' opinions arise from his "new view of the nature of the divine" (113). For Xenophanes as a theologian, who very likely had metaphysical arguments to back up his beliefs, see Barnes (above, n. 2) 84-94.

[12] See Lesher (above, n. 11) 99 for references: e.g. *Od.* 5.4; Hes. *Th.* 548. Above all, there is the passage at *Il.* 8.17-27, in which Zeus boasts of his being "mightiest of all the gods" and of his ability to hang from a peak of Olympus all the gods, together with the land and the ocean.

fort; Lesher (above, n. 11) 113. Instead, Xenophanes offers a more adequate analysis of the divine power Homer deficiently articulates.

Xenophanes stresses that the attributes of divinity are those "fitting" or "seemly" for it to possess (B 26), and these would include, besides moral qualities, the divinity's absolute immobility or changelessness, which may be a dimension of its absolute power, since the divinity may accomplish what it wishes with its thought alone without any physical exertion. The Olympians are "ageless," but in the traditional stories they travel about, paying nocturnal visits, and staging epiphanies: "in the likeness of strangers from afar, assuming all sorts of shapes, they visit cities" (*Od.* 17.485–486). Zeus, the most powerful of the gods and their king, has his subordinates, Iris and Hermes, who bear his messages. The centurion of the Christian Bible tells Jesus there is no call for his coming to his unworthy home to heal his beloved servant, "but say in a word, and my servant shall be healed. For I also am a man set under authority, having under me soldiers, and I say unto one, Go, and he goeth; and to another, Come, and he cometh; and to my servant, Do this, and he doeth it" (*Luke* 7:7–8, King James Version). Kingly dignity, of the sort proper to the mighty King of Persia, calls for the king to refrain from running his own errands.

The divinity's immobility is one important reason Xenophanes places it beyond nature, the domain of constant change and corruption. The indignity of scurrying about after this or that objective is further reason for prohibiting the divinity from busying itself with nature. The traditional stories of the divinity that involve it intimately in the day-to-day workings of nature foster popular depictions that are even more degrading than those we find in Homer and Hesiod. Aristophanes offers an instance of this indignity when he has his character Strepsiades confess his belief that rain is just "Zeus pissing through a sieve" (*Nu.* 373). When Xenophanes turns to nature he tries to show how its workings on a daily basis are not those of divinity. A simple example is his account of the rainbow, which is traditionally a messenger of Zeus and an important omen of the divine will. Xenophanes acknowledges the traditional religious status of the rainbow, when he identifies it as "she whom they call Iris," but he immediately purges the rainbow of its religious significance by reducing it to mere cloud-stuff: "a cloud this too is by nature, | purple, red and greenish-yellow to behold" (B 32). The rainbow is no longer an omen of the divine will, and two testimonia bear witness to Xenophanes' rejection of divination (A 52). Accordingly, his reëvaluation of divinity, which takes it beyond nature, calls for a reëvaluation of nature as functioning in the ordinary course of events without divine maintenance. Xenophanes, however, allows that the greatest god "shakes all things" by his thought alone, and this would suggest that the god has some causal role to play in nature.[13] There is no suggestion that the greatest god brings about the cosmos, and there is a testimonium that affirms that Xenophanes believes in an eternal cosmos (A 37). The eternal god may yet have some influence over the eternal cosmos, just as Aristotle's divine unmoved mover, who creates nothing and who lies beyond space and time, is ultimately responsible for motion within the cosmos.

The poetic tradition contains a tension in its conception of the gods' position within the surrounding natural world. The Olympians are within nature, often capriciously disturbing the ordinary course of its events that they have responsibility over, but they are also lodged far from mortals upon Mount Olympus. Of Zeus, "who dwells in halls most high" (Hes. *Op.* 8), Homer sings: "He himself among the peaks of the mountains sat triumphant, | looking upon the city of the Trojans and the ships of the Achaeans" (*Il.* 8.51–52). The aloofness of the Olympians upon their calm mountain top contributes to their dignity and anticipates imperfectly the idea of divine transcendence beyond the hustle and bustle of nature. Yet the stress Xenophanes puts on divine immobility might be directed just as much against the Milesians in their new conception of the divine nature that calls for the eternal motion of their first principle. Diogenes Laertius reports that Xenophanes is a critic of Thales (9.18), as well as an admirer of him for his astronomical accomplishments (1.23), and Thales might be of the same opinion as his Milesian successors about the mobility of divinity, especially if he identifies his first principle water with divinity (Hippol. *Haer.* 1.1.3).

Exceptional awareness is a traditional feature of divinity. Through his oracle Apollo informs King Croesus of his unlimited knowledge and its superhuman nature: "I know the number of the sand and the measures of the sea, | both the dumb I understand and the one not speaking I hear" (Hdt. 1.47.3). The "eye" of Zeus is "all seeing" and "all understanding" (Hes. *Op.* 267), and "well he knows all things" (*Od.* 20.75). Yet Zeus can be mistaken and fooled, as in the case of Prometheus' theft of fire, in which he hides fire away "in the hollow fennel-stalk," where "it escapes the detection of Zeus" (Hes. *Op.* 52). Thus "far-seeing Zeus" is hardly the perfect embodiment of omniscience. Xenophanes holds of his greatest god, "Whole he sees, whole he thinks, and whole he hears" (B 24),[14] so that his deity is not restricted in its epistemic enterprise by the limitations of anthropomorphic organs for sensation and comprehension. In his efforts to purify the divine nature of the defects of tradition, Xenophanes purges the gods of the cruder anthropomorphisms of both Greeks and barbarians, and comes through his own *via negativa* to a conception of the divine nature beyond the reach of most human predicates. His supreme god is "not at all in body like mortals or in thought" (B 23). The god may be purely cognitive powers, and thus it may provide the model for Anaxagoras' Nous, who "has every understanding about everything and has the greatest power," and who arranges the primeval motion of the primary materials in an orderly fashion so that the cosmos comes to be (B 12).

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[13] In B 34 god "begot yellow honey," εἰ μὴ χλωρὸν ἔφυσε θεὸς μέλι, but Guthrie *HGP* 1.376 takes these words to be a "conventional phrase" that means nothing more than "if honey had never existed."

Xenophanes has been slighted as a philosopher ever since the days of Aristotle. Since Aristotle's interest in his predecessors among the Presocratic philosophers lay primarily in their natural philosophy, he concerns himself little with the theology of Xenophanes. When Aristotle comes to his rendition of the nature of causality, he dismisses Xenophanes and Melissus, "as being a little too rustic," ὢς ὄντες μικρὸν ἀγροικότεροι, to claim his attention (*Metaph.* 986b26–27). Cherniss is even more peremptory in his dismissal when he describes Xenophanes as "a poet and rhapsode" who found his way into the history of philosophy "by mistake."[15] Yet Xenophanes, despite his composing in verse and his engaging in performance-art, may be more representative of the thought of the sixth-century philosophers than scholars have hitherto allowed. His speculation is shaped primarily by theology, and this may be true of most of the early philosophers. Accordingly, Xenophanes may provide a window upon the thought of those natural philosophers of whom fewer traces of their opinions have survived. Most scholars appreciate that Xenophanes is primarily occupied with theology rather than natural philosophy, but they are unwilling to concede much in the way of theological interests for the Milesians, Anaximander and Anaximenes. Barnes dismisses any theological-sounding language of the Milesians as mere "lip-service to the gods"; Barnes (above, n. 2) 99. Xenophanes, however, can be appreciated as having his antecedents in the speculation of his predecessor Anaximander, who too should be appreciated as placing divinity beyond nature, and who very likely is the first to do so in a thorough way among the Greeks.[16] Classical scholars have not on the whole recognized the significant similarity in the theological speculation of Anaximander and Xenophanes because they have not given sufficient weight to the theological dimension in Anaximander's thought. We have only one sure sentence-fragment of Anaximander's book, and the rest of what we know of him comes largely from Aristotle or sources dependent upon his student Theophrastus. Nonetheless, a good case can be made for Anaximander's preoccupation with theology and for his pious attitude towards the divine nature. And the same may be said of his presumed student Anaximenes.

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[14] Diogenes Laertius 9.19 reports in his own rendition of B 24 that the embodied god of Xenophanes also does not breathe, οὐσίαν θεοῦ σφαιροειδῆ, μηδὲν ὅμοιον ἔχουσαν ἀνθρώπῳ· ὅλον δὲ ὁρᾶν καὶ ὅλον ἀκούειν, μὴ μέντοι ἀναπνεῖν. Diogenes is also one of those who speak of this embodied god as "spherical."

[15] H. F. Cherniss, "Characteristics and effects of Presocratic philosophy," *JHI* 12 (1951) 335. Barnes (above, n. 2) 84-94 is a notable exception, and he offers reconstructions of what might have been Xenophanes' arguments for divine properties.

Anaximander's cosmogony has for its first principle the *apeiron*, the "boundless," and this word for the first principle may indicate its nature as an unknown material substance, the "indefinite," rather than its nature as an "infinite" expanse of material. The *apeiron* may very well extend infinitely in space, just as it exists infinitely in time (A 15), and it lies beyond and encloses the cosmos that arises from it. The testimonium of Ps.-Plutarch expresses Anaximander's account of the coming-to-be of the cosmos from the *apeiron* in vivid biological language:

> … what arose from the eternal and is germinative of hot and cold was separated off at the birth of this cosmos, and a kind of sphere of flame from this grew around the air about the earth like bark around a tree (*Strom.* 2 [A 10]).

The cosmos comes to be when the *apeiron*, the "eternal," throws off the γόνιμον, a seed-like object that is "germinative of hot and cold." Hot and cold would exist in actuality only after they develop from the seed, and thus neither the seed nor the *apeiron* from which the seed "separates off" would actually be hot or cold. This conforms to those testimonia that relate that the *apeiron* is "neither water nor any other of the things called elements" (A 9, Arist. *Ph.* 204b22–29), since in these earliest days of cosmology fire, air, water, and earth had yet to be sorted out from the properties they bear of hotness, coldness and the like.[17] The verb "separate-off" (ἀποκρίνεσθαι), which describes the way the *apeiron* throws off the seed, enhances the biological character of the passage, since "separate-off" is used in medical works for the ejection of seed in conception.[18] Hesiod too follows a biological and a genealogical model of explanation, in which Earth gives birth to Heaven and the Sea, and Earth and Heaven together give birth to the Titans. Anaximander's biological rendition of cosmic generation is far less anthropomorphic, and more abstract than Hesiod's theogonic generation, and thus the biological language of Anaximander may be merely metaphorical.

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[16] Pherecydes does not remove divinity altogether from the natural world, since the goddess Chthoniê serves as the divine substructure of the earth. For a comparison of Pherecydes and Anaximander, see H. Granger, "The theologian Pherecydes of Syros and the early days of natural philosophy," *HSCP* 103 (2007) 135-163.

The *apeiron*, in addition to engendering the cosmos, has an influence on its state. It "encompasses all things and all things pilots," as Aristotle reports (*Ph.* 203b10–15 [A 15]), and in his testimonium Aristotle also reports that the *apeiron* is "divine." We find also in separate testimonia the *apeiron* described as "ageless" (Hippol. *Haer.* 1.6.1 [A 11, B 2]) and "deathless" (Arist. *Ph.* 203b13 [A 15, B 3]), and Homer often pairs these two adjectives (ἀγήρως τ' ἀθάνατός τε) to underscore the divinity of deities or their instruments (e.g. *Od.* 5.218, *Il.* 2.447, 8.539, 12.323). Although these adjectives are never together in the same testimonium, Anaximander may have used them together, but even if he did not, he may still have used them to mark the divinity of the *apeiron* and to express in the poetic words of Homer his homage to its divinity.[19] He may use these adjectives above all to stress that the *apeiron* under a Homeric description replaces the gods of Homer and Hesiod.[20]

The impersonality of Anaximander's divine *apeiron* is the earliest undisputed recorded reflection of the sixth-century movement in theological speculation, which is especially vivid in the thought of Xenophanes, away from divine anthropomorphism. The *apeiron* is not burdened with the limitations of human-like properties, and it allows no room for the scandalous tales of the traditional polytheism, whose anthropomorphic deities are heavily weighed down with human foibles: moral, emotional, and even physical limitations. The divinity plays no role in the maintenance of the weather or in bringing about other "meteorological" phenomena, which, in addition to the weather, include any sort of phenomena of the upper air, comets, meteors, lunar and solar eclipses. Anaximander seems to pay particular attention to meteorological events. Instead of divinities we find in his explanations the same mechanism of "separating-off" that we found in his cosmogony:

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[17] For the opposites of hot, cold, and the like as "quality-things," see F. M. Cornford, *Principium Sapientiae: A Study of the Origins of Greek Philosophical Thought* (Cambridge 1952) 160-163.

[18] See H. C. Baldry, "Embryological analogies in Pre-Socratic cosmogony," *CQ* 26 (1932) 27 with n. 8, and Kahn *Anaximander* (above, n. 7) 156.

[19] For Anaximander's use of these adjectives, see KRS 117; Jaeger (above, n. 2) 202 n. 39.

[20] Kahn *Anaximander* (above, n. 7) 43 suggests that when Diogenes Laertius says of Anaximander's view, καὶ τὰ μὲν μέρη μεταβάλλειν, τὸ δὲ πᾶν ἀμετάβλητον εἶναι (2.1), the Homeric ἀγήρως has become "unchanging."

> Winds come to be when the finest vapors of the air are separated off (ἀποκρινομένων) and when by gathering together they are set in motion; rain from the vapor that bursts forth from the earth beneath the sun, and lightning whenever wind breaks out and cleaves the clouds (Hippol. *Haer.* 1.6.7 [A 11]).

Zeus is no longer the wielder of lightning and the gatherer of rain clouds, and the divinity for Anaximander, as in the theology of Xenophanes, is in its transcendence beyond the ordinary workings of nature. Yet Anaximander's impersonal divinity has a personal dimension in that "it pilots all things," and its guidance may be what underlies the cosmic order. The sole sentence-fragment from Anaximander's book maintains that retributive justice rules over the interactions between opposing cosmic forces: "for they pay penalty and retribution to each other for their injustice according to the assessment of time" (B 1). Possibly, the divine *apeiron* is the pilot that initiates or sustains the domination of this cosmic justice. Hesiod and Homer would welcome a providential divinity, since they depict Zeus as the enforcer of justice among humankind (e.g. *Od.* 13.213–214; *Op.* 225–247). But in the case of Anaximander the presumed "providence" would have nothing of the capriciousness of the traditional gods and would be only the enforcement of a regular and foreseeable exchange of position between the predominate and the subordinate powers within the cosmos. Night and light must give way to one another in an orderly pattern over the course of the day and of the year.

There are indications of a high style of expression on Anaximander's part, and he may adopt this style as the language appropriate for the elevated topic of the divine nature and its tutelage over the cosmos it gives rise to. The poetry of Hesiod's hexameters provided him with his high medium of piety, and Osborne contends that verse, rather than prose, is the standard medium for the early philosophers.[21] But our one sure fragment from Anaximander's book is in prose, and Simplicius' comment upon the passage, or perhaps Theophrastus," that its language is "rather poetic" (*in Phys.* 24.20–21), may signify nothing more than the commentator's opinion that Anaximander makes use of metaphors or images drawn from the courtroom to describe the interaction between the cosmic opposites. Anaximander in all likelihood intends for his words to be taken literally. Cosmic change is subject to the objectivity of disinterested justice, instead of the partiality of the fickle Olympians. Yet for all that, Anaximander's prose may have possessed a high degree of artistry, and he may borrow Homer's poetic adjectives for divinity, ἀγήρως and ἀθάνατος, for his *apeiron*. The authors of prose do not call upon the Muses, who endow their minions with the power of versification. Still these prose authors may endow their words with a certain majesty for dealing with high topics. They may rise above the prosaic speech of everyday life by making use of rhythmic expressions, assonance, striking word-order, and vivid images, stylistic techniques that have their origin in verse.[22] Heraclitus brings this "poetic prose" to perfection. Deichgräber argues convincingly for the pious character of the prose of Anaxagoras when he writes of his principle Nous, and antiquity noted his book for its "pleasant and dignified composition" (ἡδέως καὶ μεγαλοφρόνως ἡρμηνευμένον, D. L. 2.6). Deichgräber draws attention to Anaxagoras' use of "solemn predication," in which there is "a heaping up" of ponderous predicates upon the subject of Nous: "unlimited," "self-controlled," "alone," "finest," "purest" (B 12).[23] Heraclitus in his pious prose does much the same when he describes his deity: "The god day-night, winter-summer, war-peace, satiety-hunger" (B 67). These grand, but conflicting, terms used to "name" the god also form a pair of chiasmi in their stately progression. A chiasmus is a phrase constructed on an *abba* pattern, in which the *a*-terms match in some fashion, as well as the *b*-terms. In the first two pairs of terms the negative and positive terms, "winter" and "summer," are the inverse of the positive and negative terms, "day" and "night," and the same arrangement holds for the second two pairs of terms. The chiasmus has its provenance in poetry, but it is also favored by the early authors of prose.[24] When Aristotle describes Anaximander's *apeiron* as what "encompasses all things and all things pilots," this phrase, καὶ περιέχειν ἅπαντα καὶ πάντα κυβερνᾶν, is stylistically in the form of a chiasmus, in which the phrase's two transitive verbs match, just as their plural objects correspond.[25] This ostensible artistic feature might indicate that the passage records the words of Anaximander, but—what is also significant—the passage has a solemn hymnal quality in its close repetition of "all things"; Jaeger (above, n. 2) 30–31 with n. 43. Xenophanes makes conspicuous use of hymnal language when he says of his supreme god, "whole he sees, whole he thinks, and whole he hears" (B 24), in which the hymnal features consist in the passage's solemn, anaphoric repetition of "whole" and in the use of the same basic grammar in all three phrases.[26] The poetic artistry of Anaximander may show itself after all in the words of B 1, ἐξ ὧν δὲ ἡ γένεσίς ἐστι τοῖς οὖσι, καὶ τὴν φθορὰν εἰς ταῦτα γίνεσθαι κατὰ τὸ χρεών,[27] which form a rhythmic balance between generation and destruction. At their core these words form an antithesis in the symmetry of a chiasmus, in which the prepositional phrases "from which things" and "into these" match as the *a*-terms, just as "generation" and "destruction" correspond antithetically as the *b*-terms.

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[21] C. Osborne, "Was verse the default form for Presocratic philosophy?" in C. Atherton (ed.), *Form and Content in Didactic Poetry* (Bari 1997) 23-35. For arguments against Osborne's contention, see H. Granger, "Poetry and prose: Xenophanes of Colophon," *TAPA* 137 (2007) 403-433.

[22] For more on the poetic features of the prose of the early philosophers, see J. D. Denniston, *Greek Prose Style* (Oxford 1952) 2, who proposes that these authors used their poetic prose as a medium "consciously exalted to the level of an exalted theme."

[23] K. Deichgräber, "Hymnische Elemente in der philosophischen Prosa der Vorsokratiker," *Philologus* 88 (1933) 347-361.

A remark of Diogenes on the nature of Anaximander's book has fostered the popular interpretation of his book as something less than a finished, polished book, and as more of a handbook or an *aide-mémoire*.[28] Diogenes says of his book, τῶν δὲ ἀρεσκόντων αὐτῷ πεποίηται κεφαλαιώδη τὴν ἔκθεσιν, which is usually translated in some such manner as, “He made the exposition of his resolutions in a summary fashion” (D. L. 2.2). The phrase, κεφαλαιώδη τὴν ἔκθεσιν, could also be translated by “the exposition in headings,” and Anaximander may have divided up his account into the topics that typically go into the subsequent exhibitions of natural philosophy.[29] Even if his book were brief, its author’s aspirations need not be any the less literary. Heraclitus’ book was probably not long.

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[24] For the prominent use of the chiasmus in early prose, see S. Lilja, *On the Style of the Earliest Greek Prose* (Helsinki 1968) 133.

[25] KRS 115 suggest that this phrase "may form a single rhythmical unit."

[26] In his examination of the hymnal qualities of the prose of Anaxagoras and Diogenes of Apollonia, Deichgräber (above, n. 23) 360 cites B 24 of Xenophanes as an example of hymnodic verse.

[27] For what should count as the words of Anaximander in the context of Simplicius' quotation, see Kahn *Anaximander* (above, n. 7) 166-178.

[28] An *aide-mémoire* could be a word-for-word rendition of what the performer recites, but it might be merely notes that provide the performer with reminders as he performs. Upon such an interpretation, Anaximander's book would be on a par with lecture notes, which, as some scholars have thought, might just be what his book is; i. e., nothing more than a basis for Anaximander's public lec-

No certain fragments of Anaximenes, whom tradition treats, like Hecataeus, as a student of Anaximander, have come down to us. Yet

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tures: e.g. H. Fränkel, *Early Greek Poetry and Philosophy* (Oxford, 1975) 257 n. 9; H. Thesleff, “Presocratic publicity,” in S.-T. Teodorsson (ed.), *Greek and Latin Studies in Memory of Cajus Fabricius* (Göteborg 1990) 112; C. H. Kahn, “Writing philosophy: prose and poetry from Thales to Aristotle,” in H. Yunis (ed.), *Written Texts and the Rise of Literate Culture in Ancient Greece* (Cambridge 2003) 146. If Anaximander’s book were lecture notes, we should expect less polish to be put into its composition. See A. Laks, “Écriture, prose, et les débuts de la philosophie grecque,” *Methodos* 1 (2001) 131-151, for a defense of the importance of literary prose for the early Greek philosophers. Thesleff, “Scientific and technical style in early Greek prose,” *Arctos* 4 (1966) 90-92, however, also surmises that the philosophers who wrote in prose prior to the treatise of Anaxagoras composed in a “gnomic style,” which he takes to have its “culmination” in the writings of Heraclitus. Thesleff allows that composition in pithy passages without an intrinsic connection between them could take an artistic form. M. S. Schofield, *An Essay on Anaxagoras* (Cambridge 1980) 25, offers a more plausible view of the nature of Anaximander’s book than Thesleff’s proposal of a gnomic style when he suggests that Anaxagoras “was writing in an Ionian tradition of philosophy whose standard mode of exposition was the cosmogonical narrative.” The events of cosmogony and its aftermath would seem to call for a narration, in which passages are clearly linked in chronological sequence, just as we find in Hesiod’s theogony, and the gnomic style would seem thoroughly inappropriate for this. Kahn *Anaximander* (above, n. 7) 199 has surmised that Anaximander developed his book chronologically, as a “kind of epic poem,” with a clear “beginning, middle, and end,” which begins with the coming-to-be of the primal forces of the cosmos from the *apeiron* and ends in the appearance of man. This narrative form for cosmogony and its aftermath is what we would expect from authors who have before them for their precedent Hesiod’s chronological narration of theogony.

[29] Laks (above, n. 28) takes this to be the correct interpretation of Diogenes’ comment; see also Thesleff, “Scientific and technical style” (above, n. 28) 90 n. 5. Kahn “Writing” (above, n. 28) 145-146 also suggests that Anaximander’s book set the pattern for the standard topics and the order of their display in the books of the natural philosophers. See also W. A. Heidel, “Hecataeus and Xenophanes,” *AJP* 64 (1943) 262.

we still have some indication of his writing also in a high style for pious reasons. Anaximenes is reported to speak of his first principle, like Anaximander, as "boundless," as an *apeiron*, but Anaximenes' *apeiron* is very different from Anaximander's. It is not unknown, but is air and thus very definite in character. As air it might be thought to be the least perceptible of what may be observed in nature, "when it is most even, it is invisible" (Hippol. *Haer.* 1.7.2 [A 7]), unlike earth, or fire, or water, and thus Anaximenes might have hit upon air as something of a definite, knowable nature, but the least discernable of what is available in observable nature, of what is less definite itself, so that it may serve as the basis for all else. Anaximenes, however, still shares a great deal with his alleged teacher. His *apeiron* is eternal, always in motion, possibly infinite too, and it too is divine (Aët. 1.7.13 [A 10]). Air too encompasses all things and perhaps "pilots" all things as well, as is indicated by a testimonium of Aëtius that scholars debate as something close to the very words of Anaximenes: "Just as our soul, being air, holds us together, so the whole cosmos breath and air encompass," οἷον ἡ ψυχή ἡ ἡμετέρα ἀὴρ οὖσα συγκρατεῖ ἡμᾶς, καὶ ὅλον τὸν κόσμον πνεῦμα καὶ ἀὴρ περιέχει (B 2).[30] Air gives rise to the cosmos, and the cosmos itself is air and everything in it is nothing but air in condensed or rarefied forms (A 7).[31] Anaximenes depersonalizes the natural world through his depersonalization of the divinity by his making it into a natural, commonplace stuff that goes into the constitution of every cosmic object.

Diogenes Laertius tells us that Anaximenes "used simple and unremarkable Ionic speech," κέχρηταί τε λέξει Ἰάδι ἁπλῇ καὶ ἀπερίττῳ (2.3), which is a judgment that may go back to Theophrastus (or to Apollodorus). As Osborne stresses, this description of Anaximenes' style does not rule out his writing in a plain form of verse; Osborne (above, n. 21) 29. Diogenes' words, however, would hardly lead one to suppose that Anaximenes wrote in verse, especially since if he had done so the doxographers who were accustomed for many generations to the predominance of prose for the philosophical medium would certainly have noted his exception, along with those of Xenophanes, Parmenides, and Empedocles.

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[30] Aëtius reports these words as if they were Anaximenes'. For the dispute over the authenticity of these words attributed to Anaximenes, see Guthrie *HGP* 1.131-132, who takes the passage to be largely authentic.

[31] D. W. Graham offers reasons for thinking that this standard interpretation of the monism of Anaximenes is mistaken: "A Testimony of Anaximenes in Plato," *CQ* 53 (2003) 327-337.

Thesleff, however, argues that the comment of Diogenes need not mean that Anaximenes' style was "a dry and concentrated matter-of-factness," but only that it did not possess the poetic fireworks of the prose of someone like Heraclitus; Thesleff (above, n. 28) 91 n. 6. Thesleff thinks that possibly Anaximenes' book possessed an "elevation of style," and for credible evidence he points to some of the phrasing in the testimonium of Hippolytus, most likely an excerpt from Theophrastus, which could make a plausible claim on being close to, if not exactly, the words of Anaximenes.[32] The pertinent part of the sentence reads: ἀέρα ἄπειρον ἔφη τὴν ἀρχὴν εἶναι, ἐξ οὗ τὰ γινόμενα καὶ τὰ γεγονότα καὶ τὰ ἐσόμενα καὶ θεοὺς καὶ θεῖα γίνεσθαι, τὰ δὲ λοιπὰ ἐκ τῶν τούτου ἀπογόνων (*Haer.* 1.7.1 [A 7]). Although Thesleff makes nothing of it, other scholars have noted the peculiarity of the word "offspring" (ἀπόγονοι) for the "products" of air, and have presumed that it is the word of Anaximenes, which reflects the same biological model of explanation we found in Anaximander and goes back to Hesiod's genealogical explanations.[33] The best candidates for the progeny of air, from which "the rest" come to be, are the "gods and divine things," which are most likely the other "elements" (besides air) that go into the makeup of the cosmos, fire, wind, cloud, water, earth, and stone, which arise most immediately from the rarefaction and condensation of air. The list goes beyond the traditional four elements of fire, air, water, earth, but this narrowing of the cosmic elements to these canonical four is probably due to Empedocles who identifies them as the "four roots of all things" in his physics (B 6). Simplicius in his own paraphrase of what is probably the same excerpt from Theophrastus also lists in the same order fire, wind, cloud, water, earth, and stone as what emerge from air, and his wording makes it clear that it is "from these the other things" come to be (A 5).

Thesleff finds notable the "assonance and accumulation" of the opening of the sentence from Hippolytus, which is more art than would be expected of the doxographers. But it is the peculiarity of the "accumulation" that is especially striking, as the solemn invocation of all that the first principle air is responsible for, namely, all things, in the present, past, and future, as well as what counts as divinity, "from which come to be things now *and* things having been *and* things that shall be *and* gods *and* things divine,” with each component in the series hammered forcefully by the reiterated particle καί. The phrasing is not that of a doxographer, but of Anaximenes who is praising his divine first principle as the ground of all else that there is, and this phrasing can be traced to a poetic ancestry. The phrasing of present, past, and future recalls closely the phrasing found in the poets for the extraordinary breadth of the events prophets have access to. Homer uses similar phrasing to describe the great prophetic scope of the seer Calchas: ὃς ᾔδη τά τ’ ἐόντα τά τ’ ἐσσόμενα πρό τ’ ἐόντα, “who knows things that are and that shall be and that had been before” (*Il.* 1.70). Hesiod uses exactly the same wording as Homer when he describes the great scope of the events the Muses have within their capacity to convey: εἴρουσαι τά τ’ ἐόντα τά τ’ ἐσσόμενα πρό τ’ ἐόντα, “relating things that are and things that shall be and things that had been before” (*Th.* 38, cf. 32). Anaximenes may borrow this high-sounding language of poetry to express his pious praise of the grandeur of the deity in its comprehensive responsibility for all that there is. In turn, he may be followed in his solemn phrasing by subsequent natural philosophers for the same reasons. Anaxagoras uses similar words to describe the great scope of the organizing influence of Nous: καὶ ὁποῖα ἔμελλεν ἔσεσθαι καὶ ὁποῖα ἦν καὶ ὅσα νῦν ἐστι καὶ ὁποῖα ἔσται, πάντα διεκόσμησε νοῦς, “And whatever things were to be both whatever were and as many as are now and whatever shall be, all things mind ordered” (B 12).[34] Empedocles does the same when he describes the great scope of what comes to be from his divine elemental substances: ἐκ τούτων γὰρ πάνθ’ ὅσα τ’ ἦν ὅσα τ’ ἐστι καὶ ἔσται, “For from these all things as many as were and as many as are and shall be” (B 21.9).[35] The language of Anaximenes may provide the precedent for the pious phrasing of these two fifth-century natural philosophers for their description of the great range of the productive and organizing power of their first principles.

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[32] Kahn *Anaximander* (above, n. 7) 149-150 argues for Hippolytus' testimonium as "a very close paraphrase" of Anaximenes' words. Barnes (above, n. 2) 1.97 finds that "Hippolytus is garbled" in his account and makes an "absurdity" of Anaximenes' views.

[33] Kahn *Anaximander* (above, n. 7) 149-150, 156, and id. *H.* 137.

Anaximander proposes an eternal, impersonal divinity for the agent that gives rise to our cosmos. This divinity remains largely mysterious, and one of the few things Anaximander allows that we may know about it is its state of eternal motion (A 9), which he may base upon its being alive. Our empirical knowledge is restricted to what emerges from the divine *apeiron* and cannot include in its scope the *apeiron* itself. The cosmos is the product of the opposites or the elemental substances, of hot, cold, moist, dry, or of fire, air, water, earth (Arist. *Ph.* 204b26–28), which the *apeiron* throws off in its generation of the cosmos. What we know through experience is restricted to the opposites or the elemental substances and the sorts of things they give rise to through their combination with one another in various ways. Although the *apeiron* throws off these opposites or elemental substances, it is not any one of them, or even strictly a mixture of them. Instead, it may be best understood as some sort of fusion of the elements, in which their contending powers for heating and cooling, drying and moistening, are held in abeyance, so that the *apeiron* may remain stable and not fly asunder, in contrast with cosmic objects that in their volatility are subject to decay and destruction.[36] The *apeiron* is not within the range of what we may know through perception, and, since our cosmos is made up of these sorts of perceptible things, the *apeiron* transcends our perceptible world. It remains, however, physical, in spite of its supercosmic status, because it possesses the physical properties of spatiality and mobility.

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[34] Simplicius quotes this line from the text of B 12 in four different ways. See Schofield (above, n. 28) 145 n. 1 for the above version of the line.

[35] Heraclitus uses a similar pattern when he speaks of the eternity of the cosmos as “fire ever living,” ἦν ἀεὶ καὶ ἔστιν καὶ ἔσται πῦρ ἀείζωον (B 30).

Despite his strong disagreement with Hesiod, Anaximander has a strong affinity with him when he lays down, like Hesiod, a mystery behind the cosmos. In his *Theogony* Hesiod makes no effort to explain from what the first deities of his theogony emerge (116–120), and this gap in his explanatory scheme is glaring. Pherecydes may be thought to offer an improvement upon Hesiod's genealogical explanation when he introduces his eternal trinity at the foundation of reality; e.g., KRS 71. Hesiod, however, may have a defense for his remaining silent upon the antecedents of Chaos, who comes to be "first of all" the gods. Hesiod might plausibly argue that these antecedent conditions lie even beyond the purview of the gods and the Muses. Chaos comes into existence, unlike any of the other gods, without any epithet. The location of Chaos within Hesiod's conception of the world-order is far from certain, and to a large extent scholars call upon the etymology of χάος for their supposition that this first deity is a "gap" or "chasm" of some sort within the world-order (*Th.* 700).[37] At a late stage in his poem Hesiod holds that the defeated Titans have been banished to a place "across *dark* Chaos," πέρην

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[36] For the *apeiron* as a fusion of the opposites as "quality-things," see Cornford *Principium* (above, n. 17) 161-162.

[37] E.g. Jaeger (above, n. 2) 13; Cornford (above, n. 17) 194 and n. 1.

Χάεος ζοφεροῖο (814), and Chaos without any mate gives birth to the first divine offspring, "Erebus and black Night," who are male and female twin versions of darkness (123).[38] The darkness of Chaos and its engendering forms of darkness may be meant to indicate that Chaos comes from circumstances about which nothing can be known.

The *apeiron*, from which our cosmos emerges, remains largely beyond the reach of human comprehension. Anaximander's book probably did not dwell much on the divine *apeiron*, beyond what the testimonial record relates, since little can be known about it. Xenophanes may be allied in his thought with Anaximander, since he proposes a transcendent deity who lies beyond what humans may know: "and of course the clear and certain truth no man has seen nor will there be anyone who knows about the gods and what I say about all things" (B 34, tr. Lesher). Both men posit a mysterious divinity behind the workings of the visible cosmos, and the verse of Hesiod may provide a precedent for their position when it depicts the emergence of the world-order from unknown conditions.

The views of Anaximander and Xenophanes are in sharp contrast with those of Anaximander's alleged student Anaximenes. Anaximenes characterizes his own *apeiron* as divine, just as Anaximander does, but Anaximenes makes his divine *apeiron* observable air. He lays down an immanent, knowable divinity, whereas Anaximander and Xenophanes propose a transcendent, unknowable divinity. Heraclitus of Ephesus, who is a younger contemporary of Anaximenes and Xenophanes, is closer in his theological speculation to Anaximenes. Although Heraclitus is no pantheist, as Anaximenes might be plausibly construed, he does posit a divinity that is common to everything in the cosmos, which is the whole of reality for Heraclitus, but this divine commonality is comparable to the way the "laws" of a city are common to its citizenry (B 114).

Most scholars have little problem in conceding the significance of Heraclitus' theological concerns.[39] Any rendition of Heraclitus' divinity must put at its center his comments on the *logos*, of which B 1 provides his opening words on the topic, the first sentence of which reads: "Although this Word is always men are uncomprehending, both before hearing it and once they have heard." The nature of this "Word" has provided a topic of controversy, and Barnes and West take *logos* to signify nothing more than Heraclitus' "book."[40] Heraclitus probably quibbles on *logos* as his "book" and as the "Word" by which "all things come to pass" (B 1), which makes up the central content of his book. Long ago Aristotle complains about the difficulty of reading Heraclitus, which he traces to his disregard for proper "punctuation," and Aristotle appeals to the first sentence of B 1 for his illustration of syntactical ambiguity (*Rh.* 1407b11–18). The lack of punctuation makes it impossible to determine to which clause "always" belongs: "the Word is always" or "always men are uncomprehending." The "always" should be read with both clauses, and therefore the sentence demands a double-reading.[41]

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[38] Although *Erebus* is a neuter noun, the deity plays a masculine role as the consort of Night.

[39] Barnes (above, n. 2) 99 willingly acknowledges Heraclitus' devotion to divinity.

Ambiguity is a much-recognized feature of Heraclitus' style, which makes him hard to read, but he does not write obscurely for its own sake. His obscure style is probably in imitation of the Pythian Apollo: "The Lord whose oracle is at Delphi neither declares nor hides, but gives a sign" (B 93). Ambiguity is the medium of prophecy, certainly of Apolline communication, whether prophetic or not.[42] Heraclitus appropriates the ambiguity of the Pythian Apollo for his own medium because there is a significant parallel between the nature of things in the form of the *logos* and the Apolline medium.

The *logos*, by which all things come to be, is the basis of human wisdom: "Listening not to me, but to the *logos*, it is wise to agree that all things are one" (B 50). The unity of all things is something Anaximenes would readily affirm, since in his monism all things are just variations on air, just cooler or hotter forms of air, which amount to nothing more than denser and rarer forms of air. Heraclitus does sound like a monist when he says that "out of all things one, and out of one all things" (B 10), but the case for his monism is not strong, and it may be largely the product of Aristotle and the doxography.[43] B 30 provides the best textual evidence for Heraclitus' holding a monism like Anaximenes', in which, instead of air, fire provides the stuff of all else: "this cosmos … was always and is and shall be fire ever living." Fire plays a central role in Heraclitus' cosmos, but the mercantile imagery of B 90 bars it from playing a monistic role: "For fire all things exchange and fire for all things, just as for gold goods and for goods gold." Fire stands to all things just as gold in its role as a monetary unit stands to the merchandise in the marketplace. A monistic comparison between fire and gold should treat gold as the material that goes into the makeup of such objects as gold coins. Whatever the exact role of fire may be in the cosmos, it is closely associated with the *logos* in that fire is connected with the guiding-principle of the cosmos: "Thunderbolt steers (οἰακίζει) all things" (B 64).

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[40] M. L. West, *Early Greek Philosophy and the Orient* (Oxford 1971) 114-115; Barnes (above, n. 2) 59.

[41] Kahn, *H.* 92-95 argues convincingly for reading the "always" of the first sentence of B1 with both clauses.

[42] C. Sourvinou-Inwood, "Delphic Oracle," *OCD*^{3} 445-446, suggests that the ambiguity of Apolline oracles is not due to the Apolline prophets' trying "to hedge their bets," but it is the acknowledgment of the "ambiguity inherent" in the god's prophecy and of human fallibility in apprehending the future. For the ambiguity of the Greek deities in communication and in nature, see M. Detienne, *Masters of Truth in Archaic Greece* (New York 1996) 84-86.

[43] Barnes (above, n. 2) 63 adopts Aristotle's monistic interpretation of Heraclitus, although he admits that the evidence is "thin." Among others, D. W. Graham,

The unity Heraclitus has in mind is not the materialist monism of Anaximenes, but the paradoxical unity of opposites. This hidden truth of the unity of opposites contradicts common sense and the teachings of the wise, "but humans have supposed some things unjust and others just" (B 102). Within the essence of each thing a "strife" holds between opposing powers, without which the cosmos and everything in it could not retain their integrity, and this strife at the center of reality further offends conventionality because it is beneficent and just (B 80). The opposing powers within the essence of each thing coöperate by issuing in a unified object through their striving with one another: "They do not comprehend how each thing quarrelling with itself agrees; it is a connection turning back on itself, like that of the bow and the lyre" (B 51; cf. B 54). There could be no bow or lyre without the tension that arises from the powers of their wood and string for pulling in opposite directions. Thus the essence of things will display opposing properties just as Apolline speech will display multiple meanings. "Sea water" provides an example of the unity of opposites through its exemplification of the opposing properties of purity and impurity, "for fish it is drinkable and life-sustaining, for men it is undrinkable and deadly" (B 61).

There are many other *logoi*, and Heraclitus knows of them: "Of all those whose *logoi* I have heard, no one reaches to the point so that he may recognize that the wise from all is set apart" (B 108). But there is just the one *logos* that should be obeyed, and "It is law too to obey

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"Heraclitus' criticism of Ionian philosophy," *OSAP* 15 (1997) 1-50, argues convincingly against Aristotle's interpretation.

the counsel of one" (B 33). The *logos* is common, vulgar, omnipresent, and it shows itself, or hints at itself in everything. Its omnipresence is after the fashion in which the "law" of a city is common over the whole of the law-abiding, even the lawless, citizenry:

> Those who speak with understanding must rely firmly on what is common to all as a city must rely on law, and much more firmly. For all human laws are nourished by one, the divine; for it prevails as it will and suffices for all and is more than enough (B 114).

The *logos* is shared by all in the way a community practices or exercises a custom or a νόμος. Even the lawless abide by the law in their evasion of the law, which calls upon them to act in the way that allows them to elude the law. Evasion, however, is impossible in the case of the *logos:* "All things fire coming suddenly upon shall judge and shall overtake," πάντα τὸ πῦρ ἐπελθὸν κρινεῖ καὶ καταλήψεται (B 66). It is perhaps not too misleading to say that the divinity is present in the way the law of inertia is present across the universe. The divinity as law-like in nature or as itself a law is an original contribution to theology. The law-like nature of the divinity brings out a new way of conceiving of the divine omnipresence or divine immanence, in place of the monism of Anaximenes, and it also brings out something of the power of the divinity over all things, as the ruling-principle within the nature of things.

Heraclitus would seem to believe that the divinity in its law-like nature just is the unification of opposites as this unity manifests itself in each and every thing and as what is responsible for the order within the cosmos and its eternal maintenance. In B 67 he brings together the divinity, the unity-in-opposition, and very likely fire:

> The god is day-night, winter-summer, war-peace, satiety-hunger. It alters, as when mingled with perfumes, it is named according to the pleasure of each.

Heraclitus extols his god, and the grand names he gives it pass in chiasmic procession from the cosmic to the human level. In his praise Heraclitus brings out the universal, common scope of god, in the broad range of god's permutations, of the multiple ways the unity of opposites manifests itself, through all the different "perfumes." Plausibly, it is the divine fire that embodies these contrasting "perfumes" through its "alterations," presumably through its embodiment in law-like fashion in everything that there is.

Xenophanes' major contributions to theology lie in his introduction of the immobility of divinity and in his replacement of the anthropomorphic model with, or its constriction to, a cognitive model. The divinity is a purely cognitive agent, perceiving, thinking, and knowing, perhaps a pure mind, which can bring about change through mere thought alone, and which, therefore, provides the embodiment of the greatest conception of pure power, in which the deed may coincide with its thought. Heraclitus may be thought to follow Xenophanes in his rejection of anthropomorphic cult: "These images they pray to as if one were chatting with houses" (B 5). Heraclitus' movement towards the divine nature as law-like in character conforms with the movement of the Milesian *physiologoi* and of Xenophanes away from a divinity cast in personal terms. Heraclitus, however, escapes the scepticism that threatens Xenophanes' theology (B 34.1–2). In its ubiquity the deity of Heraclitus is immanent and ready-to-hand, in everything, even in the knower himself.[44]

Fire is psychic stuff (B 76), alive, "fire ever living" (B 30), and what governs, steers or pilots all things (B 64). Is it providential in its steering all things in such a way that it looks after the welfare of humanity? Does "thunderbolt" steer everything towards the good? In typical Heraclitean fashion the answer is both affirmative and negative: "To god all things are beautiful and good and just, but humans have supposed some things unjust and others just" (B 102). The "good" is perhaps not what can be fully appreciated by mortals as good. The divine fire is cosmic intelligence if we read the corrupted Greek of B 41 so that the γνώμη is the "thought" by which "all is piloted through all": ἓν τὸ σοφόν· ἐπίστασθαι γνώμην ὁτέῃ κυβερνᾶται πάντα διὰ πάντων.[45] Heraclitus, and maybe Xenophanes, may be taken to build upon Anaximander's idea of divine stewardship. The retributive principle of justice that keeps in balance the opposing forces of the cosmos operates for the overall good of the cosmos without any attention given to the fleeting goods of humanity.

Heraclitus is much more severe than Xenophanes in his criticism of Greek religious practices. As any reader of Sophocles' *Antigone* may conclude, Heraclitus outrages traditional reverence for the dead when he says of corpses, in three words only, that they should be disposed of more quickly than "dung" (B 96), where he picks the crudest word available for dung (κοπρίον). This is an insult and looks like a challenge to traditional piety, since it runs so counter to it: the funeral rites owed to the dead are owed to the gods (*Ant.* 519, 1070–1076), and Creon and Antigone, who in her own words "dares a righteous crime" (ὅσια πανουργήσασα, 74), are contending over what is holy, εὐαγής (521). The soul of Patroclus appears in a dream to Achilles and urgently implores him to bury his corpse quickly so that his agitated soul may pass "the gates of Hades" and find repose (*Il.* 23.71). Heraclitus' insult, however, offends also the new beliefs of the Orphics, whose grave sites in southern Italy and elsewhere indicate that the followers of Orpheus engaged in distinctive burial practices.[46] Xenophanes has nothing to match these harsh words of Heraclitus. At most he reduces the goddess Iris to the stuff of colored clouds. Yet what does Heraclitus' criticism come to? Dung is waste, offal, but also manure for new life. Is this insult less of an insult, or not one at all? No matter what the event, it remains provoking.

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[44] See Kahn, *H.* 267, who affirms in his comments on B 5 the immanence of Heraclitus' deity. Marcovich, *H.* 438, however, takes B 108 to be the expression of divine transcendence, "the wise from all set apart." Marcovich's translation of κεχωρισμένον as "different from" would suggest something weaker than divine transcendence.

[45] Burkert *Gk. Rel.* (above, n. 2) 309 seems to read B 41 in this fashion. This rendition of B 41 adopts the reading of Vlastos, "On Heraclitus,"*AJP* 76 (1955) 352-353 with n. 33, against that of Kirk, *H.* 386-390. Guthrie, *HGP* 1.428-429 with n. 1 supports Vlastos' rendition of B 41. See Marcovich, *H.* 449 for a thorough review of the text of B 41.

Heraclitus might be thought to bring out the absurd features in traditional religious practice: "They purify themselves in vain with blood when defiled with it, as if a man who had stepped into mud were to wash it off with mud. He would be thought mad if any man noticed him acting thus" (B 5).[47] His pointing out the comparability of the ritual practice of cleansing oneself of blood-guilt with a blood-sacrifice and of the mad act of cleansing oneself of mud with mud looks like a reduction to absurdity through an analogy. Blood, however, has opposing properties, polluting and purifying, which comes out neatly in Heraclitus' Greek by the double use of the single occasion of "blood" by the two verbal forms flanking it: καθαίρονται … αἵματι μιαινόμενοι. Since Heraclitus approves of the conjunction of opposing properties, one is at a loss how to assess definitively the import of this passage. Yet he does not approve of this bloody ritual, since he describes it as exercised "in vain" (ἄλλως).[48]

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[46] Parker (above, n. 5) 485, 496-498. Herodotus 2.81 reports that those who engage in the rites of Orpheus cannot be buried in woolen garments.

[47] This rendering of B5 is based on the proposal of Marcovich, *H.* 459.

[48] C. Osborne, "Heraclitus and the rites of established religion," in A. B. Lloyd (ed.), *What is a God?* (London 1997) 40 n. 2, retains the ἄλλως of the manuscript, instead of the emendation of ἄλλῳ, which Kranz adopts, and she takes

Also B 5 might reconcile opposites in another way, since the purification ritual would appear to be madness, like cleansing oneself of mud with mud, if it were not for its religious purpose. The first sentence of B 15 reconciles opposites more explicitly in this sort of way: what is shameful if done without thought of Dionysus, the god of sexual vigor and exuberance, is not shameful when done in his worship when his devotees "march in procession and chant the hymn to the phallus." The word-play of B 15 is impressive, where Heraclitus establishes verbal associations between "genitals," "shame," "most shameless," and "Hades": αἰδοῖον, αἰδώς, ἀναιδέστατα, and Ἀίδης. For Heraclitus these linguistic connections indicate a real connection between the life-giving genitals and death, and when he identifies dried-up Hades and juicy Dionysus he is indicating the unity life and death constitute. The Orphic poems are filled with the assimilations of traditional gods. But the truth they may bear is distorted, and "the mysteries (μυστήρια) practiced among men they get themselves initiated into in an impious way" (B 14).[49] These men are unaware that when they follow the current practices in their initiations into the secret rites, their pursuit of life in Dionysus in sex and wine is their pursuit of death in Hades, since it is death for souls to become wet (B 77).

The unwholesome nature of the current practices of the mysteries is that they lead their participants away from the truth of the *logos* and bring about a dulling of the intellect. Falsehood dulls the mind. And the sleepy-headedness of wine and of sex brings about a diminution of the intellect and leads the initiate into sleep and intellectual death. We should awake from the slumber of folly and become "wakeful watchers of the living and the dead" (B 63). Scholars have often taken these "wakeful watchers" to indicate Heraclitus' belief in the resurrection of the dead, or at least of selected dead.[50] The phrasing of the fragment is reminiscent of the language of Hesiod when he describes the task of the race of the golden men after their death, as "immortal

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this text to support her translation "in a different way." The reversion to the manuscript reading of ἄλλως does not rule out the translation of "in vain."

[49] For the text for this rendering of Heraclitus B 14, see T. M. Robinson, *Heraclitus: Fragments* (Toronto 1987) 85-86 and Marcovich, *H.* 464. For the view that Heraclitus has some regard for the mysteries, see Guthrie, *HGP* 1.476, KRS 209-210, R. Seaford, *Reciprocity and Ritual: Homer and Tragedy in the Developing City-State* (Oxford 1994) 226-228, 321-322.

[50] Kahn, *H.* 254-256 is prominent among those who take B 63 to be evidence of Heraclitus' belief in the resurrection of the souls of some selected dead.

watchers of mortal men" (*Op.* 253). Yet a better case can be made for these "wakeful watchers" as the wise who have awakened from the stupor of their sleepy ignorance, since Heraclitus equates ignorance with the subjectivity of sleep (B 89).[51]

Both Xenophanes and Heraclitus are possibly polytheists. This is perhaps more certain in the case of Xenophanes (B 23.1), but Heraclitus allows himself to speak of "gods" now and again (B 5, B 24). Neither theologian abandons the tradition altogether. Xenophanes may be appreciated as in effect affirming the basic presumptions of tradition when he undertakes his purification of traditional religious language under the direction of his more astute estimation of what is entailed by the traditional belief in the goodness and strength of the greatest deity (Hes. *Th.* 49). But Xenophanes does not make any apparent use of the old names or any of the traditional epithets for the gods. His greatest god remains unnamed, and Xenophanes remains more abstract in his discourse on the divine nature, on gods and the greatest god. Heraclitus does not abandon the names or the epithets, but he uses them unconventionally or even paradoxically. He follows, but deviates in important ways from, traditional religious thought. Below are a few notable examples of Heraclitus' unconventional use of conventional religious language, stories, and conceptions.

(1) Heraclitus designates Apollo indirectly as "the lord whose oracle is in Delphi" (B 93), which is a description and not a traditional name or epithet for the god. Heraclitus mimics the obliquity of the Pythian Apollo himself, who gives a "sign," and scholars generally take his analysis of Apolline speech to be an indirect analysis of his speech and the *logos* that makes up the heart of reality.[52]

(2) Artemis is the twin sister of Apollo, and Diogenes reports that Heraclitus deposited his book at her great temple in Ephesus (9.6). His dedication of his book to the goddess may amount to its publication and to his making his thoughts available to the public, rather than, as some scholars—e. g., Kahn, *H.* 2—have proposed, his secreting them away from the vulgar. Heraclitus

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[51] For a detailed defense of this sort of interpretation of the "wakeful watchers" of B63, see H. Granger, "Death's other kingdom: Heraclitus on the life of the foolish and the wise," *CP* 95 (2000) 260-281.

[52] E.g., Kahn, *H.* 123-124. J. Barnes, "Aphorism and argument," in K. Robb (ed.), *Language and Thought in Early Greek Philosophy* (La Salle 1983) 101, is one of the few to question this common interpretation of B 93.

would not shun publicity, since he firmly believes that the truth of the *logos* is common and open to anyone, and not a private possession of the privileged few. The twin children of Leto may have furnished Heraclitus with the two sides of his display of the truth: his medium of indirect expression and his public venue for his publication.

(3) "One, the wise alone, is not willing and is willing to be called by the name of Zeus" (B 32). The genitive Ζηνός may be used to allude to the infinitive ζῆν "to live,"[53] but at any rate this passage brings sharply to the fore Heraclitus' ambivalence towards tradition. He is willing to appropriate for his first principle a traditional name of the supreme god of Homer and Hesiod, but he is not willing to adopt it without qualification. There is no impiety in its use and none in its neglect. The "wise alone" tolerates the use of Zeus by mortals for its name, since the Zeus of tradition is the wisest and the most important of the gods, but, like Xenophanes' unnamed deity, the wise in itself has no proper name.

(4) The only other surviving use of "Zeus" among Heraclitus' fragments is found in B 120 with an epithetical-like attribute: "The limits of dawn and evening is the Bear, and, opposite the Bear, the watcher of luminous Zeus," ἠοῦς καὶ ἑσπέρας τέρματα ἡ ἄρκτος καὶ ἀντίον τῆς ἄρκτου οὖρος αἰθρίου Διός. The star Arcturus is "the Bear-watcher" or "warder," ὁ Ἀρκτοῦρος, and the Bear Arcturus watches is the constellation Ursa Major, a mark for the celestial pole-star. The time of rising of Arcturus is the middle of September, and in Hesiod is a signal for fall and spring (*Op.* 566, 610); Kahn, *H.* 161–163. Zeus has a traditional association with fire, as the wielder of lightning bolts, and as the hoarder of fire, who will not share it with mankind. Hesiod recounts the theft of Prometheus and describes the fire he steals as "unwearying," πυρὸς μένος ἀκαμάτοιο (*Th.* 563), and this lack of fatigue might be a feature of fire that Heraclitus found attractive in his efforts to understand the limitless power of divinity.

(5) Heraclitus stresses the importance of fire as a guiding-principle in "Thunderbolt (κεραυνός) steers all things" (B 64), and the thunder-

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[53] This is a common interpretation of Heraclitus' use of the genitive Ζηνός in B 32; e.g., Kahn, *H.* 268–271; Guthrie, *HGP* 1.463; Robinson (above, n. 49) 102.

bolt is famously the primary weapon of Zeus “who delights in thunder,” τερπικέραυνος, and “who thunders aloft,” ὑψιβρεμέτης.

(6) The Sun is often called on in oaths, as what sees and hears all things: Ἠέλιός θ’, ὃς πάντ’ ἐφορᾷς καὶ πάντ’ ἐπακούεις (*Il.* 3.277). The cosmic fire of Heraclitus is like the traditional Sun in its vigilance: “All things fire coming suddenly upon shall judge and shall overtake” (B 66). But the fiery Sun sets and fails to be ever vigilant, whereas the divine fire never sets so that Heraclitus may ask rhetorically: “How would one ever escape the unsetting?” (B 16). Heraclitus recognizes something of the nature of his ever-watchful divine fire in the traditional ideas of the fiery Sun and of high-thundering Zeus.

(7) Fire is a kind of judge and enforcer in B 66, and Justice is spoken of in similar language in B 28: “Justice shall overtake the contrivers of falsehoods and their witnesses,” Δίκη καταλήψεται ψευδῶν τέκτονας καὶ μάρτυρας. The virgin Justice is a daughter of Zeus (Hes. *Op.* 256), and Zeus is closely associated with retributive justice: “Zeus … who oversees all | men and punishes whoever transgresses,” Ζεὺς … ὅς τε καὶ ἄλλους | ἀνθρώπους ἐφορᾷ καὶ τείνυται ὅς τις ἁμάρτῃ (*Od.* 13.213–214; cf. Hes. *Op.* 225–247). Justice, strife, war, fire, and even the *logos* seem to merge in Heraclitus’ thought, although not in a way that makes for a clear formulation. In Anaximander’s cosmic speculation penalties and retributions are handed out among the great cosmic powers through the assessments of time. The “measures” of the sun are temporal and spatial (B 94), and Heraclitus’ conviction about the stability or regularity of nature disallows any story like that of Phaethon, the son of Helios, whom Zeus is compelled to blow out of the sky with thunderbolts when he imperils the earth with his uncontrolled ride upon his father’s chariot (Ov. *Met.* 1.750–2.329). Yet the vigilance of Zeus in his quick response to Phaethon’s threat is in keeping with Heraclitus’ principles about the enforcement of order.

(8) In B 94 the Furies are the “assistants of Justice,” indeed her enforcers, who assure that the Sun will keep to his measures. Scholars have noted the possibility of word-play on the name of the Furies and the word for strife, Ἐρινύες from ἔρις,[54] and Heraclitus may take this etymological link between the words to support his belief

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[54] E. Hussey, “Epistemology and meaning in Heraclitus,” in M. S. Schofield and M. C. Nussbaum (eds.), *Language and Logos* (Cambridge 1982) 54.

in the identity of "Justice" and "Strife" (B 80). "Luminous Zeus" in B 120 corresponds to "Justice" in B 94. Zeus and Justice each have trusted aides who assist them in supervising the orderly pattern in the motions of those celestial bodies that are intimately involved in important terrestrial events, such as day and night and the seasons that divide the year.

(9) Dionysus is identical with Hades (B 15). The assimilation of deities is also very likely a characteristic of early, as well as late, Orphic poetry, and the equation of gods is a feature in allegorical analysis.[55] Hesiod may too provide for Zeus's undergoing changes after a fashion through his association with the different personifications of Zeal, Victory, Might, and Force. These personifications "always sit at the side of Zeus," and are inseparable from him (*Th.* 388), and there may be a parallel between the way these personifications are intimately associated with Zeus and the way "god" for Heraclitus changes between day and night, winter and summer, war and peace, satiety and hunger (B 67).[56]

(10) A much-used epithet of Zeus is "father of men and gods," πατὴρ ἀνδρῶν τε θεῶν τε (*Il.* 1.544), and in B 53 "the father of all" is War, who is also the "king of all." Although Zeus is the king of the gods, only on occasion does he go by the epithet θεῶν βασιλεὺς καὶ ἀνδρῶν, "king of gods and men" (Hes. *Th.* 923). The god of war is Ares, not Zeus. Heraclitus may find the unity of fire and strife displayed in an assimilation of Zeus and Ares, and Heraclitus may recognize these two traditional gods as the two sides of the divine nature.

The wording of B 53 is outstandingly hymnal: "War is father of all, and king of all, and some he exhibits as gods, some as men, some he makes slaves, some free," πόλεμος πάντων μὲν πατήρ ἐστι, πάντων δὲ βασιλεύς, καὶ τοὺς μὲν θεοὺς ἔδειξε τοὺς δὲ ἀνθρώπους, τοὺς μὲν δούλους ἐποίησε τοὺς δὲ ἐλευθέρους. The chiasmic wording of B 53 has much in common with the wording and content in the passage Hesiod opens his *Works and Days* with, in which he praises Zeus for his majestic power for lowering the famous and mighty and for raising the weak and unknown:

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[55] Parker (above, n. 5) 495; Janko (above, n. 7) 73.

[56] For this suggestion, see M. D. Northrup, "Hesiodic personifications in Parmenides A 37," *TAPA* 110 (1980) 226 and n. 10, who draws a parallel between Hesiod's elaboration on the nature of Zeus through different personifications and B67 of Heraclitus' fragments.

> ὅν τε διὰ βροτοὶ ἄνδρες ὁμῶς ἄφατοί τε φατοί τε,
> ῥητοί τ’ ἄρρητοί τε Διὸς μεγάλοιο ἕκητι.
> ῥέα μὲν γὰρ βριάει, ῥέα δὲ βριάοντα χαλέπτει,
> ῥεῖα δ’ ἀρίζηλον μινύθει καὶ ἄδηλον ἀέξει,
> ῥεῖα δέ τ’ ἰθύνει σκολιὸν καὶ ἀγήνορα κάρφει
> Ζεὺς ὑψιβρεμέτης, ὃς ὑπέρτατα δώματα ναίει.
>
> Through him mortal men alike are unnamed and named,
> sung and unsung, by means of great Zeus.
> For easily he strengthens, and easily the strengthened he crushes,
> Easily the conspicuous he diminishes and the obscure he increases,
> Easily he straightens the crooked and the arrogant he withers,
> Zeus who thunders aloft, who in the highest halls dwells (*Op.* 3–8).

What is Heraclitus trying to achieve with the unconventional use of conventional religious ideas and language?

Xenophanes in B 1 judges the traditional divine stories to be impious, and he puts his recommendations in the pious language of “men must hymn the god” and make do “with reverent stories and purified words,” εὐφήμοις μύθοις καὶ καθαροῖσι λόγοις. He calls upon his audience to make a libation and engage in prayer, and at the conclusion of B 1 he stresses that it is good “always to be mindful of the gods.” Nothing of this sort of invocation of piety, which follows so closely traditional language and practices, appears in Heraclitus. Yet in contrast with Xenophanes, Heraclitus does not purge his speech of the traditional divine names and epithets. Pythagoras too uses conventional religious terminology and ideas for novel purposes, as the *akousmata* credited to him would indicate,[57] and perhaps he uses this conventional language to some degree to reassure his auditors that he is still working within the tradition, or not too far from it, and to soften the novelty of his opinions. After all, the Pythagoreans make concessions to traditional practices. Unlike the followers of Orpheus, they accommodate in their dietary restrictions the traditional animal-sacrifices of the Greeks.[58] Pythagoras or the early Pythagoreans may hide behind traditional religious language and practice. Heraclitus, however, gives the traditional language and stories a distorting twist that shocks his audience and leaves it puzzled, when he speaks of that which alone is wise, as what "is not willing and is willing to be called by the name of Zeus" (B 32). Some readers merely dismiss the puzzles, others are stirred to thought, enough so that they may awaken from their unreflective slumber. Heraclitus provokes his audience into piety, of which a wakeful state of awareness provides a necessary condition for a pious state of mind. Genuine piety is contemplation of divinity, or, as Xenophanes would say, "it is always good to be mindful of the gods."

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[57] For instance, the “islands of the blest” the Pythagoreans identified with “the Sun and the Moon” (Iamb. *VP* 82), and “Tartarus” they also designated as a place of punishment (Arist. *Apo.* 94b33). The sea is “the tear of Cronos”; the Great and the Little Bear are “the hands of Rhea”; the Pleiades “the lyre of the Muses”; the planets “the dogs of Persephone”; “daemons” can be trapped in bronze (Porph. *VP* 41). The “oracle of Delphi” is identified with the “tetractys” (fourness), which, in turn, is identified with the “harmony the Sirens sing within” (Iamb. *VP* 82). Iamblichus records one *akousma* that identifies Pythagoras with the “Hyperborean Apollo” (140).

Heraclitus does not, however, twist the language of religion merely to provoke. Traditional religious language and the practices and stories it informs remain intrinsically related to the truth of the *logos*. Heraclitus, however, is no allegorist, like Theagenes of Rhegium, who tries to redeem the old mythology by constructing artificial interpretations of the tales of the gods so that he may tease somehow from them the truths of reality that Homer expresses in a veiled fashion; see the testimony collected at D-K 8. Instead, Heraclitus recommends that the astute may detect through careful analysis of the traditional religious language and its stories the truth that they bear in an obscure way, just as the discriminating may be aided in their appreciation of the unity of life and death, when they recognize that the word for the death-dealing bow through a mere shift in accent, from βιός to βίος, can be appreciated as the word for "life" (B 48). Words and the practices they shape cannot fail to be a key to reality, even when they are misused by Homer and Hesiod, or by the priests of the Eleusinian Mysteries, or even by the followers of Orpheus. Thus, despite his criticism of tradition, Heraclitus cannot abandon the traditional way of talking about the divine nature for an altogether new way, although only through twisting the traditional religious stories and their language around in unexpected ways can he find the proper way to reveal the divine truth. Homer is wrong to have Achilles pray for the disappearance of strife "between gods and men" (A 22, *Il.* 18.107), since Homer fails to appreciate that the "father of all," if properly understood, is "War" (B 53) and that "'Justice" is "Strife" (B 80). In accord with the reformed idea of divinity initiated by the Milesians and taken up by Xenophanes, Heraclitus refashions the old religious formulas so that they may reveal the true nature of divinity and may furnish the proper litany for its praise.[59]

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[58] The Pythagoreans had elaborate dietary restrictions, which included, in addition to the celebrated prohibition on beans, forbidding the consumption of the mallow and certain fish. The Pythagoreans did, however, allow the consumption of sacrificial beasts, and this kept them from coming in conflict with the traditional sacrificial rituals: εἰς μόνα τῶν ζῴων οὐκ εἰσέρχεται ἀνθρώπου ψυχή, οἷς θέμις ἐστὶ τυθῆναι· διὰ τοῦτο τῶν θυσίμων χρὴ ἐσθίειν μόνον, οἷς ἂν τὸ ἐσθίειν καθήκῃ, ἄλλου δὲ μηδενὸς ζῴου (Iamb. *VP* 85). The Orphics were more demanding, and they prohibited, according to Plato, the consumption of any animal flesh. For sacrifices they used cakes of meal and grain soaked in honey (*Lg.* 782c–d).

The transcendent or supernatural divinity of Anaximander and Xenophanes aids in the depersonalization of the nature Hesiod populates with highly anthropomorphic gods and goddesses. As Hesiod points out, even the best of seers can never know the mind of Zeus (fr. 303 Merkelbach-West),[60] and when natural events are under the control of whimsical deities, science would not be possible. Even though the immanent theism of Anaximenes and Heraclitus brings together nature and divinity, these theologians too are in a position to provide an improved appraisal of nature, since, like Anaximander and Xenophanes, they rid the divine nature of its cruder traditional anthropomorphisms. They tame nature through their domestication of the divinity that makes up the heart of nature. The depersonalization of the divine nature in the rejection of traditional anthropomorphisms rids the divinity of its human-like will and its predilection for falling into capriciousness. Even though in immanent theism divinity and nature are identified or intimately bound up together, as in the case of Hesiod's theology, divinity's depersonalization allows for predictable regularity in nature, and this ushers in the stability of the cosmos which was the dominating desideratum of Hesiod as well. Hesiod endeavors in his *Theogony* to reassure his audience of the permanence of the current world-order under the just rule of Zeus, who, after his violent ascension to sovereignty, has shown himself capable of overcoming all unsettling obstacles that may come his way. The natural philosophers who are among the new thinkers of the sixth century provide, however, an assurance, which is more convincing, of cosmic stability in their reassessment of the divine nature.[61]

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[59] Burkert *Gk. Rel.* (above, n. 2) 309-310 takes Heraclitus to rebuild the "bridge" to tradition with his "ceremonial prose" or "prose art" after the Milesians, with their "matter-of-fact" prose, had dismantled it.

[60] Hes. Fr. 303 M-W ap. Clem. Alex., *Strom.* 5.14.129: μάντις δ' οὐδ' εἷς ἐστιν ἐπιχθονίων ἀνθρώπων, | ὅστις ἂν εἰδείη Ζηνὸς νόον αἰγιόχοιο. It is uncertain to what work this fragment belongs.

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7. Heraclitus on Measure and the Explicit Emergence of Rationality

Anthony A. Long

Heraclitus made remarkable contributions to the *idea* and the ideal of rationality. In particular, he prefigured many of the distinctive ways by which Plato and subsequent Greek philosophers conceptualized this cardinal notion. These are the two propositions I intend to substantiate in my paper. No one, I presume, needs to be persuaded that Heraclitus' *logos* involves rationality in some sense or senses of that word.[1] The interest of the inquiry turns entirely on what Heraclitus himself was seeking to express with the term *logos* and on why, in recounting his own *logos,* he uses such words as μέτρον, νόμος, ἁρμονίη, κόσμος, δίκη, γνώμη, σωφροσύνη, ξυνός, and ὁμολογεῖν;[2] for I assume that Heraclitus, rather than invoking any pre-existing concept of rationality connoted by the word *logos,* found himself largely in the process of discovering that very thing. This is not to say that he created it from nothing. He had available to him, as we see from the inherent meanings of *logos,* such concepts as meaningful discourse, account, ratio, and reckoning; and he also had available, as we see from the other Greek terms I have listed, such further concepts as measure, proportion, balance, law, structure, order, arrangement, judgment, plan, moderation, commonality, and coherence. His *logos* is or has or bespeaks all of these notions, and accordingly it comprises much that we moderns associate with rationality. My thesis, in essence, is that Heraclitus discovered an idea and ideal of rationality by incorporating such notions in his *logos,* something that no one, to the best of our knowledge, had done before.

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[1] I intend this generalization to encompass both the minimalist interpretations of *logos,* favored by M. L. West, *Early Greek Philosophy and the Orient* (Oxford 1971) 124–129, and J. Barnes, *The Presocratic Philosophers*^{2} (London 1982) 59, (for whom *logos* is simply Heraclitus' account, without metaphysical and theological connotations) and interpretations represented by Kirk, *H.* 65–71, 188–189, which take the term's referents to include divine law. I side with Kirk—see Long, "Heraclitus and Stoicism," in id., *Stoic Studies* (Cambridge 1996) 47–51—in thinking that Heraclitus adumbrated the Stoic conception of a universal causal principle, which is not to say that he anticipated their notion of a benevolently designing and ruling deity. Actually, even Barnes (ad loc.) allows that Heraclitus B 1 "makes it clear that his 'account' must include or embody something like a general 'law of nature'." From the copious literature, I select the following as particularly helpful programmatic statements concerning the Heraclitean *logos:* Kahn, *H.* 102, "rationality as a phenomenal property manifested in intelligent behavior," and Hussey, "Heraclitus" in Long (ed.), *The Cambridge Companion to Early Greek Philosophy* (Cambridge 1999) 93, who says of the "authority that the *logos* enjoys…. It can be none other than the impersonal kind of authority that is intrinsic to *reason* or *rationality."* See also Dilcher, *H.* ch. 2.

[2] To which one could add τάξις if DK 22 A 5 line 15 (fr. xliiiB Kahn), derived from Theophrastus, was a word Heraclitus, following Anaximander, applied to the temporal determinacy of cosmic changes. See below, p. 206 for Plato's use of the same word at *Gorgias* 503e ff.

If there is a single term that captures the essence of rationality, as Heraclitus conceived of it, we should opt for the word μέτρον, measure. Heraclitus' focus on measure, and on the conceptual relations and implications of "measure," whether for cosmology or mind or ethics, was his most salient contribution to providing an *explicit* formulation of rationality. I emphasize explicit, to avoid giving the impression that I take Greeks before Heraclitus to have implicitly lacked rationality or rational practices. The metrical form and structure of Homeric epic, Hesiod's catalogues of divine genealogy, social practices for settling disputes by means of witnesses and the citation of evidence, the political convention of making speeches *pro* and *contra,* counting and measuring all of these, like human language as such, are implicit manifestations of rationality. Long before Heraclitus, too, the Greeks had an intuitive understanding that behavior is normative (σωφρονεῖν) precisely to the extent that it is *sensible* or *moderate* or *orderly* (κατὰ κόσμον or κατὰ μοῖραν). What Heraclitus discovered, so I propose, was not how to make all of this explicit, but how to articulate rationality in terms of measured or proportional processes both in (what we would call) non-animate nature (including, specifically, the unity of opposites) and also in analogous discourse, mental disposition, and day-to-day conduct.

Notice, too, that what I am attributing to Heraclitus is *an idea,* not a complete account, much less an analysis, of rationality. Rationality comprises much more than we find in Heraclitus, including, for instance, formal proof, rules of logic, or the best means to achieve a given end. It also involves procedures, such as reductionism and economy of explanation, which he uses but which are probably not presupposed by his explicit interest in measure and proportion. Heraclitus' conceptualization of rationality, nevertheless, had a profound influence on Greek philosophy.[3] It also articulated and helped to propagate the pre-philosophical notion that order and moderation are essential to the proper functioning of things, whether human or divine.

In order to make the case for Heraclitus' seminal contribution to the idea of rationality, I adopt a three dimensional methodology. Of prime importance, obviously, are the conceptual connections Heraclitus invites us to make between the terms μέτρον, νόμος, and so forth, that figure in his most suggestive statements. However, I shall not start from his own text because any progress we can make in understanding Heraclitus' idea of rationality requires us to situate that idea within his cultural context. Which brings me to the other two dimensions of my methodology.

When we do the history of philosophy, we generally proceed by asking how a given thinker positions himself in relation to his predecessors, following the forward arrow of time. Heraclitus himself, moreover, requires us to do this because he alludes so pointedly and critically to the older authorities Homer, Hesiod, Pythagoras, Hecataeus, and Xenophanes[4] He must suppose that these authorities have failed to grasp and live up to his idea(l) of rationality, which does not imply, of course, that he has failed to learn from them or could have thought as he does without them. Hence a further dimension of my inquiry will involve us in asking what we can learn about this idea by viewing it against the background of earlier Greek thought. Important though this background is, what we can learn from it is severely limited by the huge gaps in our knowledge. What, for instance, was it about Pythagoras that irked Heraclitus so much? If Pythagoras had the interests in musical ratios attributed to him by the later tradition, Heraclitus should, it would seem, have counted him an important ally in his own pursuit of rationality and cosmic harmony. Thus Kahn, *H.* 204 suggests that. Heraclitus' conception of cosmic order in terms of λόγος and ἁρμονίη should be seen as a generalization of the Pythagorean notion of musical ratios. Maybe so. But I find this suggestion hard to reconcile with Heraclitus' polemic against Pythagoras as "the prince of swindlers" (B 81).

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[3] Plato, Aristotle, and Stoics frequently signify the normative sense of rationality with the expression ὀρθὸς λόγος, Translators typically render this phrase by "right reason" or "correct rule," but they would do better, in my opinion, to opt for "correct ratio" or "right proportion," in line with what I take to be Heraclitus' seminal conception of rationality.

[4] Xenophanes B 17, 40, 42, 57, 67.

It is tempting, on the other hand, to think that Anaximander escaped Heraclitus' censure precisely because the latter sympathized with some of his Milesian predecessor's ideas. The two thinkers shared an interest in measurement, balance, and cosmic justice.[5] All of these notions are fundamental components of Heraclitean rationality. A complete papyrus of Anaximander's book might show us even greater lexical and conceptual affinity to Heraclitus than we are able to state from our meager documentation. But one thing I very much doubt that it would reveal is Anaximander's interest in human psychology, ethics, and politics.[6] We have every reason to suppose that Anaximander, like his fellow Milesians, was primarily a cosmologist, albeit one whose interests were broad enough to include the origins of life and also geography. Heraclitus had the much more complex ambition of integrating cosmology with (what we would call) ethics, psychology, epistemology and politics.[7] It is that integration, so I think, that makes him such a seminal figure for understanding the distinctive evolution of rationality in subsequent Greek philosophy.

This observation brings me to the third dimension of my methodology. Rather than working from Heraclitus' own words or from his relation to his predecessors, I want initially to study his idea of rationality through what I take to be its afterlife. An obvious way to do that would take us forward to the Stoics, who drew so much inspiration from reflection on Heraclitus. As I have argued elsewhere, they interpreted Heraclitus with great skill and insight.[8] In the Stoic conception of a causally coherent world, pervaded and guided by the divine and fiery *logos* (of which we human beings are integral parts), the resonance of Heraclitus is obvious, as it also is in the Stoic project of a "life in agreement with nature." In this paper, rather than looking to the Stoics, I propose to approach Heraclitus from basic constituents of rationality as conceptualized by Plato. It is Plato, I will argue, who retrospectively provides us with the best conceptual threads, so to speak, for tracing and stitching together the disparate components of Heraclitean rationality.

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[5] Should we detect an implicit criticism of Anaximander in B 80 where Heraclitus identifies justice with strife? Hussey (above, n. 1) 110 n. 5, takes Heraclitus to be making an implicit "correction" of Anaximander here, but he also (89) thinks it "may be significant that Heraclitus does not attack any of the Milesians by name."

[6] For a very different view of Anaximander's primary interests, see G. Naddaf, *The Greek Concept of Nature* (Albany 2005) 92–112, whose highly political interpretation of Anaximander is hardly grounded in any firm evidence.

[7] Hence, I take it, the doxographical claim (D.L. 9.5) that his discourse *On nature* treated three subjects—the universe, politics, and theology.

[8] Long "H. and Stoicicm" (above, n. 1), which is a revised version of "Heraclitus and Stoicism," *Philosophia* 5–6 (1975–1976) 133–156.

Plato and Heraclitus on σωφροσύνη and measure

When scholars pair Plato and Heraclitus, they generally do so to contrast them. "For Plato," writes Kahn, *H.* 4), "Heraclitus is the theorist of universal flux." This is quite right as a report on Plato's statements about Heraclitus in the *Cratylus* and *Theaetetus.* According to those dialogues, Heraclitean flux excludes knowledge. I do not doubt that Plato interpreted Heraclitus accordingly; as Aristotle says *(Metaph.* 1, 987a32–4), and that it was Plato's interpretation of Heraclitean flux as the condition of phenomena that strongly motivated his theory of changeless Forms. In addition, I believe, like many scholars, that the reading of Heraclitus as essentially a flux theorist who excluded all knowledge is quite mistaken.[9] Why, then, do I turn to Plato, to elucidate Heraclitus' idea of rationality?

I do so not because I take Plato to have read Heraclitus directly as a theorist of rationality, in the way that I shall advocate. My strategy, rather, is to look to Plato for an idea of rationality that seems too strikingly similar to what I find in Heraclitus to be accidental. Has Heraclitus, then, influenced Plato after all? I do not know. Perhaps so, or perhaps it is rather the case that Heraclitus has influenced the intellectual climate in which Plato found himself. What matters, so far as I am concerned, is not Plato's actual interpretation of Heraclitus or the direct influence of Heraclitus on Plato, but the congruity of two great minds operating in more or less the same cultural milieu.[10]

According to B 112 Heraclitus identified the "greatest excellence" (ἀρετή) *and* wisdom with σωφρονεῖν.[11] Keeping that statement in mind, let us turn to Plato *Gorgias* 507e6–508a8. The context is Socrates' refutation of Callicles' undiscriminating hedonism. Here is a summary of his immediately preceding argument (503d-507c):

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[9] See Long, "Finding oneself in Greek philosophy," *Tijdschrift voor Filosofie* 54 (1992) 255–79, for a detailed defense of this view.

[10] See R. Wardy, "The unity of opposites in Plato's *Symposium*," *OSAP* 23 (2002) 1–61, who argues that Plato makes consistently positive use of Heraclitean perspectives in the *Symposium.*

[11] Cited by Stobaeus 3.1.178. Doubts about the authenticity of this fragment are well answered by Kahn, *H.* 120.

1. Every craftsman imposes organization (τάξις) and order (κόσμος) on the materials with which he works.
2. As with artifacts, so too with bodies and souls.
3. The name for organization and order in the soul is νόμος, which condition is equivalent to justice and σωφροσύνη.
4. In fact the excellence of anything is a function of τάξις and κόσμος.
5. Therefore it is the σώφρων soul that is excellent.

Having proved that psychic excellence consists in order and σωφροσύνη, Socrates continues:

> The wise say, Callicles, that heaven and earth and gods and humans, are bound together by community and friendship and order and moderation and justice. That is why they call this universe order, and not disorder and immoderation … I think you are not applying your mind to these things, but are failing to see that geometrical equality [or "proportion"] has great power among both gods and humans. You think you should practice *getting more (pleonexia)* because you neglect geometry. (507e-508a)
>
> φασὶ δ' οἱ σοφοί, ὦ Καλλίκλεις, καὶ οὐρανὸν καὶ γῆν καὶ θεοὺς καὶ ἀνθρώπους τὴν κοινωνίαν συνέχειν καὶ φιλίαν καὶ κοσμιότητα καὶ σωφροσύνην καὶ δικαιότητα, καὶ τὸ ὅλον τοῦτο διὰ ταῦτα κόσμον καλοῦσιν, ὦ ἑταῖρε, οὐκ ἀκοσμίαν οὐδὲ ἀκολασίαν. σὺ δέ μοι δοκεῖς οὐ προσέχειν τὸν νοῦν τούτοις … ἀλλὰ λέληθέν σε ὅτι ἡ ἰσότης ἡ γεωμετρικὴ καὶ ἐν θεοῖς καὶ ἐν ἀνθρώποις μέγα δύναται, σὺ δὲ πλεονεξίαν οἴει δεῖν ἀσκεῖν· γεωμετρίας γὰρ ἀμελεῖς.

In this remarkable passage Plato invokes cosmic order as a universal binding force, glossing that force as community, friendship, order, σωφροσύνη, and justice, and finally, as geometrical equality or proportion. He also exploits a pun, in the manner of Heraclitus, on κόσμος and κόσμιος. Echoes of Heraclitus are unmistakable, not only in the shared terminology, including the shared reproach concerning lack of understanding (Heraclitus B 1 λανθάνει, Plato λέληθεν*)*, but most importantly in the macrocosm/microcosm analogy. I am thinking particularly of B 114:

> Those who speak with intelligence must rely on what is common to all things [ξυνός, *implying* the commonality of νόμος] as a city relies on its law, and still more resolutely; for all human laws are nourished by one law, the divine one. For it has all the power it wants, and suffices and more than suffices for all.
>
> ξὺν νόῳ λέγοντας ἰσχυρίζεσθαι χρὴ τῷ ξυνῷ πάντων, ὅκωσπερ νόμῳ πόλις, καὶ πολὺ ἰσχυροτέρως. τρέφονται γὰρ πάντες οἱ ἀνθρώπειοι νόμοι ὑπὸ ἑνὸς

> τοῦ θείου· κρατεῖ γὰρ τοσοῦτον ὁκόσον ἐθέλει καὶ ἐξαρκεῖ πᾶσι καὶ περιγίνεται.

Just like Plato's Socrates in the *Gorgias,* Heraclitus grounds his ethics in a cosmological model, treating the world order itself as *just* or law-governed. He does not use the phrase "geometrical equality" in the extant fragments, but proportionality is central to his conception of the balance that governs natural processes. He insists (B 94) that justice governs the *measured* behavior of the sun. And, just as Socrates stresses the power of geometrical equality, so Heraclitus emphasizes the universal control exercised by divine law. We shall hardly go wrong if we connect his grounds for the excellence of σωφρονεῖν with the thought, which Socrates advances here, that appropriate human norms are validated by their correspondence to the cosmic order.

Commentators on the *Gorgias* often look to Pythagoreanism as Plato's inspiration in this passage. I do not exclude that as part of the background. Plato is often indebted to multiple predecessors. In this context, with its allusion to cosmic friendship and community, Empedocles naturally comes to mind. But I am encouraged that Terence Irwin also refers to Heraclitus B 114 in his commentary on the *Gorgias* passage (1979, 226), where he observes that Plato's "interest may be no more in Pythagoreanism than in Presocratic theory in general." Heraclitus is the first Presocratic who quite certainly used the word κόσμος in reference to the universe (B 30). There is good reason to credit him with being the prime mover of many of the ideas that Plato presents here.[12]

What may we infer from the *Gorgias* concerning Plato's idea of rationality?

Socrates in the dialogue has argued that injustice presupposes ignorance about one's own good because injustice involves a disorderly and uncontrolled self; a self that is to flourish, on this view, needs to be regulated and duly proportioned. By appealing to geometrical equality and connecting it with σωφροσύνη, Plato implies (1) that σωφροσύνη consists in a measured, balanced, and moderated mentality; (2) that that mentality is the essential condition of happiness; and (3) that it is equivalent to wisdom and the application of intelligence. Thus the *Gorgias* adumbrates the great teaching program of the *Republic* whose would-be guardians need mathematical training in order to facilitate the rule of reason over their lives and those of their fellow citizens.

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[12] With *Grg.* 492e10–493a3 (Plato's citation of Euripides, "Who knows if living is being dead, and being dead is living?" and the σῶμα/σῆμα identification), cf. Sextus Empiricus, *PH* 3.230, who attributes something very similar to Heraclitus, as noted by Dodds in his edition ad loc.

In this mathematical agenda Plato went far beyond anything proposed by Heraclitus. Yet, we may wonder what it was that authorized Plato to suppose that mathematics has an intrinsic connection with morality.[13] Outside the Greek context this connection is likely to appear quite bizarre. What did these two domains (so different from one another from our modern perspective) have in common, in Plato's eyes? The answer suggested in numerous Platonic contexts is proportion or measure.

In the myth of divine judgment with which Plato concludes the *Gorgias,* Socrates offers a graphic description of a tyrant's soul (524e–525a):

> [The divine judge] saw nothing healthy in the soul, but that it was … filled with scars from false oaths and injustice .. and everything crooked from lying and deception, and nothing straight, from being reared without *truth.* And he saw that, from power and luxury and excess and failure to control actions, this soul was brimming over with *disproportion* and ugliness.
>
> κατεῖδεν οὐδὲν ὑγιὲς ὂν τῆς ψυχῆς, ἀλλὰ … οὐλῶν μεστὴν ὑπὸ ἐπιορκιῶν καὶ ἀδικίας … καὶ πάντα σκολιὰ ὑπὸ ψεύδους καὶ ἀλαζονείας καὶ οὐδὲν εὐθὺ διὰ τὸ ἄνευ ἀληθείας τεθράφθαι· καὶ ὑπὸ ἐξουσίας καὶ τρυφῆς καὶ ὕβρεως καὶ ἀκρατίας τῶν πράξεων ἀσυμμετρίας τε καὶ αἰσχρότητος γέμουσαν τὴν ψυχὴν εἶδεν.

We are so accustomed to Plato's pairing of truth and beauty that it is tempting to accept this association without reflecting on its conceptual assumptions. Yet once one thinks about it, the question of its meaning clamors for elucidation. Truth in the sense of mere fact is often ugly. What makes truth beautiful, according to the passage I have just quoted, is to be sought from the following cluster of ideas – health, honesty, justice, moderation, straightness, control, and proportion. The truth of something, according to this model, is normative. Just as lying falls outside the norms of proper discourse, so truth also characterizes the way something should actually be if it is functioning optimally where the condition of functioning optimally is balance, straightness, and proper proportion. Hence Plato's liking for musical and mathematical illustrations of truth. A harmonious sound is true to the relevant ratios of the tetrachord. A well constructed square is true to the principle that its four sides are equal and subtend four right angles.

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[13] See M. Burnyeat, "Plato on why mathematics is good for the soul," *PBA* 103 (2000) 1–81, for brilliant suggestions in response to this question.

The beauty of truth, then, is a highly theoretical notion, grounded on ideas of symmetry and balance. This notion, as we see in the *Gorgias,* enables Plato to represent a tyrannical soul as devoid of truth precisely because such a soul is unbalanced, given to excess, and therefore ugly. Such a soul fails to impose a proper ratio on itself and its actions. Like irrationals in mathematics, which defy whole number ratio relationships, a disorderly soul is irrational, and irrational by virtue of its lack of proportion.

Accordingly, when Plato talks about the beauty of truth he is not saying that the content of any true statement (or fact) must be beautiful. The beauty of truth picks out the relation that anything with a purchase on truth (whether a soul or an action or a statement) has to the norms of straightness and proper proportion. Hence we can see why Plato could regard truth telling itself as beautiful, in as much as it corresponds and coheres with what is the case.

There is much more one could say about Plato's conceptualization of rationality in terms of measure and proportion. This cluster of ideas is especially prominent in the *Philebus,* where it is measure that heads the classification of goods (66a). But, I think I have said enough here to provide a Platonic perspective or retrospective on Heraclitus. Let us return with some detail to Heraclitus B 112:

> *Sophronein* is the greatest virtue and wisdom: to speak and do things that are true, understanding them in accordance with their nature.
>
> σωφρονεῖν ἀρετὴ μεγίστη καὶ σοφίη, ἀληθέα λέγειν καὶ ποιεῖν κατὰ φύσιν ἐπαΐοντας.

Like Kahn, *H.* ad loc., I punctuate the fragment after σοφίη, thus making the entire text a comment on good sense or practical wisdom, which is how we may gloss σωφρονεῖν. This punctuation, rather than the placing of a comma after μεγίστη, suits the sense and rhythm of the passage, with its division into three cola. The last colon, "understanding [sc. true] things in accordance with their nature," echoes Heraclitus' programmatic statements in B 1, where he presents himself as the spokesman of nature's *logos,* setting forth an account of the way things are.[14] His audience, as he regretfully says there, continually fails to heed his account, because they retreat into their private worlds. Here, in B 112, he asks us to take the message of B 1 to constitute the essence of σωφρονεῖν*,* glossing that virtue as speaking and doing things that are true.

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[14] I fail to see why Kirk, *H.* 390, characterizes B 112 as "a banal paraphrase."

What does Heraclitus mean by *"doing* things that are true"? Kahn, *H.* 122 puzzles over this curious and seemingly unparalleled expression. He suggests that Heraclitus wants to say that "the man whose thinking is sound will not hide the truth but signify it in his actions as in his words." This suggestion does not go far enough, in my opinion. Taking our lead from Plato, we shall hardly go wrong if we endow Heraclitus' ἀληθέα with connotations of straightness, balance, and due proportion. Thus his "truths," as the context of B 112 requires, are norms of properly measured action as much as they are norms of thought and speech.

Plato regularly couples "balanced" (μέτριος) with such commendatory words as σώφρων, καλός, καθαρός, ἄριστος, and βέβαιος.[15] In the *Republic* (3, 412a5) the most musical and harmonious person is the one who best combines physical and musical education and applies them to his soul in the most measured way (μετριώτατα). The mark of an unmusical and unshapely soul is ἀμετρία (6, 486d5). These contexts are in line with the passage I already discussed from the *Gorgias,* but the *Republic* proposes still more precise connections between rationality and balance or proportion.

Reviewing the newly formulated community, Socrates invites his interlocutors to agree that it could be called σώφρων and "master of itself" if its better constituent rules over its worse one (4, 431b-c). He continues:

> You all would also find especially among its children and women and slaves … a multitude of all kinds of desires and pleasures and pains … but simple and moderate ones, which are guided by *logismos* in association with intellect and correct opinion—these you would encounter only among a few people, ones with the best natural constitution—and the best education.
>
> καὶ μὴν καὶ τάς γε πολλὰς καὶ παντοδαπὰς ἐπιθυμίας καὶ ἡδονάς τε καὶ λύπας ἐν παισὶ μάλιστα ἄν τις εὕροι καὶ γυναιξὶ καὶ οἰκέταις … τὰς δέ γε ἁπλᾶς τε καὶ μετρίας, αἳ δὴ μετὰ νοῦ τε καὶ δόξης ὀρθῆς λογισμῷ ἄγονται, ἐν ὀλίγοις τε ἐπιτεύξῃ καὶ τοῖς βέλτιστα μὲν φῦσιν, βέλτιστα δὲ παιδευθεῖσιν.

Moderate or balanced emotions are the outcomes of reason's rule, or, to be more precise, the rule of calculation. We may translate λογισμός by reason or rationality, but, in doing so, we shall miss Plato's own insights if we overlook the mathematical connotations of the word. λογισμός is the disposition or faculty in virtue of which a soul has the capacity to rule itself—that is to say, impose order and balance on its emotions and desires through subjecting them to appropriate calculation or measurement or proportion.

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[15] E.g., *R.* 339b8 σωφρόνως τε καὶ μετρίως; 5, 466b6 μέτριος καὶ βέβαιος καὶ ἄριστος; *Phd.* 86c2 καλῶς καὶ μετρίως; 108c3 καθαρῶς τε καὶ μετρίως.

The same cluster of ideas recurs like a *Leitmotif* throughout the *Republic.* Truth, Socrates proposes, is akin to proportion (ἐμμετρία, 6, 486d7). Therefore, he infers, persons who are naturally suited to grasp the truths of reality (i. e. potential philosophers) require an ἔμμετρος mentality. In the dialogue's final book Socrates offers measuring, counting and weighing as the activities that correct optical and other illusions generated by the senses (10, 602d). These, he says, are the function of the soul's calculative (*logistikon*) part, which is its best part precisely because it puts its trust in measure and calculation.

The message of these passages can, of course, be amplified by reference to other parts of the Platonic corpus. In the *Protagoras* (356d-357d) Socrates proposes that it is the "measuring craft" (μετρητικὴ τεχνή) which will prevent people from making mistakes in determining what is good for themselves, where goodness is construed as achieving a preponderance of pleasure over pain.[16] Similarly in the *Philebus* (55e) all true crafts require measure and such measuring methods as weighing and counting. The final Platonic passage I offer as retrospective to Heraclitus comes from the *Laws* (4.715e7–716b5), where the Athenian Stranger, imagining himself addressing the colonists of the newly founded community, preaches to them as follows:

> God, so the ancient account tells us, holds the beginning, the end, and the middle of all beings and proceeds without deviation in his natural revolution. He is always accompanied by justice, who punishes those who forsake the divine law. One who intends to flourish sticks to justice and is compliant and well ordered, but the person puffed up by arrogance … who thinks he needs no ruler or guide … is abandoned by God … and utterly ruins himself, his household and his city.
>
> ὁ μὲν δὴ θεός, ὥσπερ καὶ ὁ παλαιὸς λόγος, ἀρχήν τε καὶ τελευτὴν καὶ μέσα τῶν ὄντων ἁπάντων ἔχων, εὐθείᾳ περαίνει κατὰ φύσιν περιπορευόμενος· τῷ δὲ ἀεὶ συνέπεται δίκη τῶν ἀπολειπομένων τοῦ θείου νόμου τιμωρός, ἧς ὁ μὲν εὐδαιμονήσειν μέλλων ἐχόμενος συνέπεται ταπεινὸς καὶ κεκοσμημένος, ὁ δέ τις ἐξαρθεὶς ὑπὸ μεγαλαυχίας … , ὡς οὔτε ἄρχοντος οὔτε τινὸς ἡγεμόνος δεόμενος … καταλείπεται ἔρημος θεοῦ … ἑαυτόν τε καὶ οἶκον καὶ πόλιν ἄρδην ἀνάστατον ἐποίησεν.

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[16] Note also *Prt.* 326b on the educational need for εὐρυθμία and εὐαρμοστία, and *Phlb.* throughout, especially 25e, 26a, and 65a.

The moral of the story is that human beings should align themselves with God. How So?[17]

> There is only *one* way so to act, and only *one account* thereof, viz. the *ancient logos* that *like is friend to like,* provided that they conform to measure; things that do not conform to measure, on the other hand, are friend neither to themselves nor to those that do conform. For us it is God who must pre-eminently be the "measure of all things," much more so than any human being, as they say [implicitly correcting Protagoras' celebrated dictum]. To become befriended to one of this sort, it is necessary to become as like to it as possible, and that means according to this *logos* that whoever of us is *sôphrôn* is God's friend, because such a one is like God.
>
> Τίς οὖν δὴ πρᾶξις φίλη καὶ ἀκόλουθος θεῷ; μία, καὶ ἕνα λόγον ἔχουσα ἀρχαῖον, ὅτι τῷ μὲν ὁμοίῳ τὸ ὅμοιον ὄντι μετρίῳ φίλον ἂν εἴη, τὰ δ' ἄμετρα οὔτε ἀλλήλοις οὔτε τοῖς ἐμμέτροις. ὁ δὴ θεὸς ἡμῖν πάντων χρημάτων μέτρον ἂν εἴη μάλιστα, καὶ πολὺ μᾶλλον ἤ πού τις, ὥς φασιν, ἄνθρωπος· τὸν οὖν τῷ τοιούτῳ προσφιλῆ γενησόμενον, εἰς δύναμιν ὅτι μάλιστα καὶ αὐτὸν τοιοῦτον ἀναγκαῖον γίγνεσθαι, καὶ κατὰ τοῦτον δὴ τὸν λόγον ὁ μὲν σώφρων ἡμῶν θεῷ φίλος, ὅμοιος γάρ. (716cl-716d2)

This passage is replete with intertextuality. It corrects Protagoras and it also strongly recalls Hesiod's Zeus whose rule over mortals in the *Works and Days* (256–85) is assisted by his daughter Justice and her inexorable attention to human conduct. But Plato is not simply parroting Hesiod. His divinity in this passage (as in book 10 of the *Laws,* the *Timaeus,* and the *Philebus)* is characterized in language that resonates with scientific overtones. Plato seems to identify divinity with the world's natural revolutions; and the idea of divinity as the principle of cosmic order is reinforced by the focus on measure. With all this leading on to characterization of the person who is *σώφρων,* we are clearly within a conceptual context that can recall Heraclitus and his prescription to follow a divine law.[18]

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[17] *Ti.* 90c-d is similar in thought and expression; see Long "Eudaimonism, divinity and rationality in Greek ethics," *PBACAP* 19 (2003) 134–137.

[18] Plato echoes Heraclitus linguistically as well as conceptually: note especially the repeated instances of *logos* and also κατὰ φύσιν and θεῖος νόμος. England [1921, ad loc.] on the authority of the scholiast and Eusebius, identifies Plato's ancient *logos* with an Orphic saying: "Zeus is beginning, Zeus middle, and from Zeus are all things accomplished, Zeus foundation of earth and starry heaven." Plato clearly had a hallowed saying in mind, but we should not assume that he cited it as being specifically Orphic. The sentiment that Zeus encompasses all things occurs in Greek tragedy (cf. Aes. *Ag.* 160 ff., and Sophocles *Tr.* 1278) and Heraclitus gives his own expression to it in B 67. As with *Gorgias* 503d ff., I do not claim that Plato had Heraclitus in mind here, but I see no reason to exclude that as a possibility.

The measures of Heraclitus

Plato, as we have seen, repeatedly spells out intrinsic connections between measure or proportion, calculation, balance, law, intelligence and σωφροσύνη. Heraclitus largely requires us to make those connections for ourselves. I now pursue more of the relevant connections, with Plato's cosmological passage from the *Laws* serving as a guideline.

We may start from unequivocal certainties. As envisioned by Heraclitus, the world is:

1. An everlasting process of the balanced, measured, and proportional changes of fire. (B 30)
2. The world, in its diurnal, seasonal, and annual cycle, is god. (B 67)
3. All things are steered by (divine) intellect. (B 41)
4. Cosmic order is an expression of divine justice. (B 94)

In these striking statements we see Heraclitus giving his own expression to the Platonic idea that cosmic order is a process and system of measure constituted by divinity. No less Platonically, he associates cosmic order and divinity with the principle of justice. What this signifies in both philosophers is a notion of "natural law," meaning that norms of conduct and retribution for misconduct are not simply human institutions, but mandated by the structure of reality. Hence Heraclitus, just like Plato, finds it appropriate to apply propositions about the world's orderly structure to the human domain, as he does explicitly in

5. Human law is nurtured by divine law. (B 114)
   or, as he does by implication in passages that emphasize the goodness of order, regularity and control, such as
6. One should fight for law as one does for a city wall. (B 44)
7. Of prime importance is the control of ὕβρις (which is the opposite of σωφροσύνη). (B 43)
8. Anger causes psychological damage. (B 85)
9. Justice seizing liars and false witnesses is inevitable. (B 28)
10. σωφρονεῖν is the prime excellence and wisdom. (B 112)

I propose that we call all ten of these Heraclitean propositions "measures," trading on the multiple senses of the English word measure to signify the following range of meanings: (i) determinate quantity; (ii) proportion or ratio; (iii) moderation; (iv) limit; (v) rule or standard; and (vi) political or judicial decision.

Heraclitus has different words to signify these different senses of "measure" but we shall not go wrong if we privilege his recourse to the term μέτρον. He applies this word to the world's constantly balanced changes (B 30), to the sun's due and regular behavior (B 94), and, in its verbal form, to the equivalence in quantity of the change from sea water to earth and back again (B 31). These are instances of measure in the sense of (i) determinate quantity; (ii) proportion or ratio; and (iv) limit. For measure in the sense of (iii) moderation we have σωφροσύνη; for (v) rule or standard νόμος; and for (vi) judicial decision δίκη.

Heraclitus' own words and their striking affinity to Platonic usage establish the cardinal importance of measure to the connections he intuited between three fundamental domains: 1, the way the world is structured as a physical system; 2, the world's divine governance and governor; and 3, the norms of human conduct. Should we, then, use measure as our translation of the Heraclitean *logos*? At least one scholar has done so, but that translation, tempting though it is, does not capture Heraclitus' creative use of the term in his most programmatic passages.[19] He did not discover the importance of measure as a criterion for acting appropriately. That notion was already present in his culture. His great innovation was to take measure as the key to understanding structure, balance, and good order. Perhaps the best English word to translate his *logos* is rationale. As such, it incorporates the measures of language and thought, if these are deployed objectively in the interests of truth.

With this in mind, I now review Heraclitus' most important statement (B 1):

> Of this rationale that is so always people are not in touch, both before hearing it and after they have first heard it.
>
> τοῦ δὲ λόγου τοῦδ' ἐόντος ἀεὶ ἀξύνετοι γίνονται ἄνθρωποι καὶ πρόσθεν ἢ ἀκοῦσαι καὶ ἀκούσαντες τὸ πρῶτον.

I translate ἀξύνετοι by "not in touch" in order to register what I take to be Heraclitus' punning allusion to ξυνός, "common," His audience, as he says in B 2, lives in a private world, unheeding of the common

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[19] Kirk, *H.* 39 finds "measure, the most common meaning, judged purely by statistical criteria in the extant fragments." Referring to K. Freeman, *Ancilla to the Pre-socratic Philosophers* (London 1956) 116, he writes "[She] has well stressed that the concept of measure is implicit in the Logos of Heraclitus," but rightly observes that it "makes but little sense to translate it thus in fr. 1," as Freeman does. Kirk himself favors "formula" for B 1, 2, and 50. Other translations he surveys include "word" (Burnet) "meaning of Heraclitus' teaching" (Snell), "argument" (Verdenius), and "account(ing)" (Minar). See also Rowett at n. 19 in this volume.

logos. By calling it common, Heraclitus is saying that the *logos* is both publicly available and also objective; it is not his personal account, and his audience are to listen not to him but to it (B 50)[20]. The objectivity of the *logos* is registered in its everlasting validity.

Heraclitus continues:

> For although all things come to pass in accordance with this rationale, human beings resemble those without experience even though they experience such words and deeds as I expound, when I distinguish each thing according to its nature and explain how it is.
>
> γινομένων γὰρ πάντων κατὰ τὸν λόγον τόνδε ἀπείροισιν ἐοίκασι, πειρώμενοι καὶ ἐπέων καὶ ἔργων τοιούτων, ὁκοίων ἐγὼ διηγεῦμαι κατὰ φύσιν διαιρέων ἕκαστον καὶ φράζων ὅκως ἔχει.

The rationale that Heraclitus states equips him both to account for *all* happenings and to provide a taxonomy of particular things, and so explain their natures. With his insights into measure, proportion and balance as the key to understanding the world Heraclitus arrived at an idea of rationality that includes the following attributes – objectivity, impersonality, law-like authority, coherence, generality, intelligibility, and accountability. Also, by emphasizing the commonality of the *logos* and berating people for failing to heed it, Heraclitus implies that rationality is essential to an authentic and excellent human life—a life which one lives awake and fully cognizant of nature's rationale.

Did Heraclitus connect the measures that constitute the world's rationale with his ideas about the soul? Two fragments bear on this question:

> You would not discover the boundaries of the soul by going, traversing every route; so deep is the *logos* that it has.
>
> ψυχῆς πείρατα ἰὼν οὐκ ἂν ἐξεύροιο, πᾶσαν ἐπιπορευόμενος ὁδόν· οὕτω βαθὺν λόγον ἔχει. (B 45)
>
> Soul has a self-increasing *logos*.
>
> ψυχῆς ἐστι λόγος ἑαυτὸν αὔξων. (B 115)

If, contrary to the first of these fragments, the soul were limited in its range, would it be capable in principle of understanding the structure of the everlasting Heraclitean world? What we seem to learn here and in the next fragment is that the soul is potentially boundless, which I take to mean unlimited in its capacity to measure, i. e., understand nature's rationale. The more the soul expands, as it were, the more it is capable of putting itself in touch with the common *logos*.[21]

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[20] The single ms. of Hippolytus (the source of B 50) was "unsure whether δόγματος or λόγος was correct in the quotation." So Kirk, *H.* 66, who gives compelling reasons for accepting the latter reading.

Antecedent and contemporary ramifications

No more than Parmenides, Empedocles or even Plato, did Heraclitus express his revolutionary philosophy by coining new terminology. The idea of rationality that I have attributed to him draws on language which is as old as Homer and Hesiod, one or both of whom use the words λόγος, μέτρον, νόμος, ἁρμονίη, κόσμος, δίκη, σώφρων, and ξυνός. Heraclitus' originality is conceptual; it consists in his meanings and the contexts in which he uses these words. In the next part of this paper I give a short linguistic survey as background for viewing his innovations.

λόγος

In its epic usage, λόγος, far from connoting rationality, pertains to discourse that is deceptive rather than true, as in the formula αἱμύλιοι λόγοι. Calypso tries to "soothe" Odysseus with such words (*Od.* 1.56), a usage that looks forward to the enchanting powers of *logos* advanced by Gorgias in the *Encomium of Helen*. Pindar, by contrast, tends to associate λόγος with such words as ἀληθής and οὐ ψευδής.[22] His usage suggests that, though λόγος has begun to acquire normative connotations, its truth or correctness needs to be specified as such, as in Herodotus 2.17.1 where ὀρθὸς λόγος refers to the "correct reckoning" concerning the flooding of the Nile.[23]

The tally of λόγος in Presocratic philosophers other than Heraclitus is surprisingly meager. Setting aside instances where the term means simply "what is said" or the familiar antithesis of λόγος/ἔργον, the only instances worth reporting are Parmenides B 7.5 κρῖναι λόγῳ and Leucippus B 2 οὐδὲν χρῆμα μάτην γίνεται, ἀλλὰ πάντα ἐκ λόγου τε καὶ ὑπ' ἀνάγκης ("nothing occurs at random but all things from *logos* and by necessity").[24] If this latter citation is authentic, it would represent the closest parallel to Heraclitus' conception of the world's *rationale* or determinate measure.

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[21] Cf. Kahn, *H.* 130: "A *logos* so profound and limitless can scarcely be distinct from the universal *logos*, according to which all things come to pass."

[22] E.g. Pi. *O.* 1.28, 4.21, 7.68, *P.* 1.68.

[23] Guthrie *HGP* 1.420–424, gives numerous examples of the usage of λόγος, but most of them, in the nature of the evidence, are from authors later than Heraclitus.

There seems to be no fifth-century parallel for Parmenides' instrumental dative.[25] In its context, the command "judge by λόγος" is intended to detach his audience from reliance on their senses. What they are to judge is the goddess's "contentious *elenchos.*" Taking *elenchos* to mean "proof," it is tempting to interpret the command as the requirement to assess the goddess's argument by discussing it. Parmenides gives an extraordinary demonstration of rationality in action, so to speak. He offers nothing comparable to Heraclitus on the conceptual connections between λόγος, μέτρον, σωφροσύνη, and so forth. The later Presocratics, according to our record, had still less to say.

μέτρον

The world of Homer and Hesiod conforms to measure. We may think, for instance, of the five scenes represented on the Shield of Achilles (*Il.* 18. 478 ff.), especially the first scene depicting earth, sea, and heavens, or the equidistance from earth of sky and Tartarus (*Theog.* 719).The expanse of the sea is actually conveyed by the word μέτρα (e.g., *Op.* 648). As the world at large is a measured or balanced structure, so in the human domain the concept of measure or due proportion serves archaic thought as its principal ethical norm. Thus Hesiod tells his farmers to "preserve measures" (μέτρα φυλάσσεσθαι), glossing his injunction by saying that καιρός (proportion) is best in everything (*Op.* 694)[26]

Here we have a classic statement of the ethics of σωφροσύνη, which Homer likes to express in such phrases as κατὰ κόσμον or κατὰ μοῖραν. He characterizes the recalcitrant Thersites as someone unmeasured in his speech (ἀμετροεπής), minded to utter "disorderly words" (ἔπεα ἄκοσμα) and act οὐ κατὰ κόσμον *(Il.* 2.212–14). We would hardly call Thersites irrational for his speaking out of line. But the semantic connections between κόσμος and μέτρον, which become so prominent in Heraclitus and Plato, facilitated the application of these words to mark intelligence. For an instructive instance, I cite Pindar, *I.* 6.71–2, where the poet praises Lampon for "pursuing measures in his judgment, and also keeping to measures [sc. in his actions?], with a tongue that does not exceed good sense": μέτρα μὲν γνώμᾳ διώκων, μέτρα δὲ καὶ κατέχων· γλῶσσα δ' οὐκ ἔξω φρενῶν.[27]

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[24] I discount instances of *logos* from ethical fragments attributed to Democritus, both on grounds of lateness and also from doubts about their authenticity.

[25] Peter Kingsley may be right to question the reading λόγῳ. He suggests to me in conversation λόγου, taking it with ἔλεγχον.

[26] According to a fragment of the *Melampodia* (Strabo 14.1.27 = fr. 278 M-W), Hesiod used a word for "true," ἐτήτυμος, in connection with the numerical calculation of a μέτρον (ἀριθμὸς ἐτήτυμος … μέτρου).

Clearly Heraclitus' audience was familiar with the general idea of measured and moderate mentality, captured in the maxim μηδὲν ἄγαν. What makes his thought so challenging is the relationship he suggests between this traditional norm and a world whose structure explicitly conforms to measure(s). Does any earlier text have a bearing on these Heraclitean propositions?

The answer is to be found in an elegiac couplet of Solon (fr. 16 West). The lines are cited by two Christian authors, who interpret them as a "very wise statement about God": "It is very difficult to know the obscure measure of intelligence, which alone holds the limits of all things" (γνωμοσύνης δ' ἀφανὲς χαλεπώτατόν ἐστι νοῆσαι | μέτρον, ὃ δὴ πάντων πείρατα μοῦνον ἔχει).

Given the absence of any context for these lines, we have to interpret them from other statements by Solon. In his longest surviving poem (fr. 1), after praying for justly gained prosperity, Solon reflects on the justice of Zeus. The god "sees the end of all things" (l. 17), but, sure though he is in his punishments, wrongdoers may be punished through their innocent children. Thus human beings are unable to discern the fairness or logic of Zeus' punishments. Mortals have their own particular mentalities and ambitions, over-confident that they will succeed. The future is unpredictable, for we are in no position to know in advance the fortunes gods will dispense to us. In a further isolated line (fr. 17), reiterating the "obscurity" of the γνωμοσύνη that encompasses everything, Solon states the pessimistic message of his long poem as follows: "The mind of the immortals is completely obscure to human beings (πάντῃ δ' ἀθανάτων ἀφανὴς νόος ἀνθρώποισιν)." The Christian source of this line says that here Solon follows Hesiod, probably with reference to *Op.* 483–4: “The mind of Zeus is different at different times and hard for mortal men to know.”

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[27] Note also Solon fr. 13. 52 West on the craftsman who knows the μέτρον of lovely σοφία.

There can be little doubt that Solon’s γνωμοσύνη alludes to some kind of divine intelligence or plan, vaguer though this is in its reference than his Christian sources took it to be. How, then, should we interpret his fr. 16? Vlastos took γνωμοσύνη to apply specifically to human justice.[28] He supported this proposal by reference to Theognis 1171–2, “The best thing gods give mortal men is γνώμη. γνώμη holds the limits of everything.” Theognis, in a clearly ethical context, appears to be alluding to Solon, but rather than agreeing with his predecessor, as Vlastos suggested, Theognis has corrected Solon’s epistemological and theological pessimism by making γνώμη a divine gift to human beings. I take Solon to be saying that the mind of the controlling divinity—or the mind of the gods in general—is virtually inscrutable for mortals.

Does he express nothing more than that quite traditional thought? The intriguing words are μέτρον and πάντων πείρατα. Solon postulates a *bounded* universe that conforms to the measure of cosmic intelligence. With these thoughts Solon seems to anticipate Heraclitus so closely that one is tempted to regard the latter as directly alluding to him, especially if we compare Heraclitus B 41 on the wisdom of knowing the γνώμη that “steers everything through everything” with Soloν’s cosmic γμωμοσύνη that holds the limits of everything.

But the allusion, if I am right, is also highly critical. Although Heraclitus and Solon agree in taking the world to be intelligently governed according to measure, they disagree on the implications of that fact for human beings. For Solon human beings have no access to any *logos* that makes the divine measure accountable. For Heraclitus, by contrast, the “obscurity” of nature (B 123) and the superiority of its “non-evident structure” (B 54, connected with Solon fr. 16 by Vlastos *loc. cit.)* are challenges to the human intellect’s powers of discovery. Thanks to the commonality of *logos,* human beings have the capacity to engage in science and thus close some of the traditional gap between the mortal and the immortal.

We may now bring in Xenophanes for three reasons. First, like Solon, he envisioned a divinity that controls all things by thought (Xenoph. B 25). Secondly, like Solon again, Xenophanes’ divinity has a mind that mortals are in no position to fathom (B 23). Thirdly, Xenophanes withholds knowledge from the statements he makes about “all things,” consigning human cognition to mere opinion or conjecture (B34–5). Xenophanes, of course, is one of the older authorities whom Heraclitus explicitly castigated (B 40). I now want to argue, with reference to that fact and what we have just observed in Solon, that this antecedent material has much to offer us in drawing conclusions about Heraclitus' idea of rationality.

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[28] G. Vlastos, “Solonian justice,” *CP* 41 (1946) 67.

Giving a measured account/rationale of all things

As early as Homer and Hesiod the Greeks showed their awareness that the physical world is an orderly system. They did not then call it a κόσμος, but they envisioned it as a limited and tripartite structure of heaven, earth and seas, and underworld, with each of these three domains under its own divine manager.[29] They also envisioned the world and its inhabitants as a regulated system, with its regulation sometimes assigned to Zeus and sometimes to Moira. Without sharply distinguishing these regulative powers from one another, in referring to Zeus, they emphasized foresight and intelligence, while their references to Moira implied necessity and an embryonic sense of causal connectedness.

This conception of the world, though imprecise in its details, was rationalistic in presupposing that events do not happen for no reason. Myth and religion provided explanations, albeit personalist ones, such as the anger of Zeus or the resentment of Poseidon, or invoked vaguely impersonal agencies, such as fate. The conception was also rationalistic in the prudential sense reflected in the value of σωφροσύνη, which signified the wisdom of self-restraint, especially with regard to one's appropriate attitude to the controlling divinities.

What this archaic outlook completely lacked, so far as one can see, was the idea that human intelligence might be able to enter the orderly cosmos it already intuited and discover laws of nature for itself, gaining some authentic access, as it were, to the operations of the divine mentality. Hence the epistemological pessimism we find in Hesiod, Solon, and Xenophanes. All three authors agreed that, while the supreme divinity itself is "far seeing" and controlling, human beings can achieve no "likeness to god" in these respects or gain a reliable measure of intellectual control over their own lives.

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[29] Cf. *Il.* 15.187–189, the division of the world into three domains for Zeus, Poseidon, and Hades; and Hesiod, *Theog.* 720, which makes heaven as high above earth as the underworld is below earth.

Heraclitus, by contrast, thought that human beings not only could but should acquire insight into *nature,* as he calls it; for, without that insight, they could not live wakeful, authentic and intelligent lives.[30] Thus, probably with strong stimulus from Milesian cosmology, he set ancient philosophy on an epistemological course quite opposite to archaic pessimism. He intuited the unifying power of structure, measure and proportion in the world's physical processes; took these to be instantiated in the operation of divine intelligence; and, in his greatest and most far-reaching innovation, posited human capacity to think and speak commensurately – i. e. in accordance with nature, and therefore rationally.

As I have written elsewhere: "Heraclitus' relation to the world is, in a sense, an attempt to think the thoughts of god. This would be a very unsafe thing to do if you were dealing with Olympian Zeus.[31] Heraclitus' Zeus, by contrast, is only equivocally the Olympian deity (B 32). Non-equivocally, his Zeus is the deep structure of the world and the world's predictable and regular processes, as manifested in the sun's cycle and the alternation of day and night (B 67). As I have also proposed elsewhere, we may characterize the general project of early Greek philosophy as "accounting for all things"—accounting, not in the sense of enumerating facts, but giving a systematic explanation why the world is the way it appears to be.[32] Heraclitus did not invent the concept of the world as a bounded totality. Yet, he was the first thinker, so far as we can see, to engage in second-order reflection on the world, by which I mean reflection on what it means to account for that totality, the universe as such.

In this paper I have investigated the conceptual constituents of his idea of rationality, focusing on measure, proportion, and structure, I could have explored his applications of that idea, by studying his techniques for rousing his audience from their epistemological slumbers, such as his challenges to common sense distinctions between day and night, up and down, mortal and immortal, or his polemics against recognized authorities. These techniques, no less than the material I have discussed, were a crucial part of his contribution to rational inquiry, but they are less directly relevant to the idea of rationality in the way it was pursued by Plato and later philosophers.

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[30] "The difference between the gods and humanity, traditionally almost unbridgeable, is for Heraclitus inessential," Hussey (above, n. 1) 103. As Hussey observes (ibid. 104), in reference to such fragments as B 78–79, which contrast the divine and the human: this "is a matter of character not of nature …. That human nature is perfectly capable of achieving real understanding is shown by … B 113 and B 116."

[31] Long, "H. & Stoicism" (above, n. 1) 273.

[32] Long, "Finding oneself" (above, n. 9) 10–13.

Given how little of Heraclitus we possess in sheer number of words, the challenge he presents to interpretation is quite remarkable. As is the case with Parmenides, or even more so, with Heraclitus there is always something else for a commentator to add. I have said nothing in this paper about his cryptic and aphoristic style. For anyone who finds these traditional marks of Heraclitus' obscurity an impediment to my main argument, I respond as follows.

Obscurity just for its own sake is the enemy of reason, and clarity is a philosopher's principal virtue. True enough. But there are no grounds, in my opinion, for thinking that Heraclitus is ever obscure purely for the sake of mystification. He often writes with such limpidity that his statements are memorable precisely because of that. When he is quite obscure—as for instance in B 62, "Immortal mortals, mortal immortals …"—I take it that the obscurity is philosophically motivated. He takes on the role of the Delphic oracle in order to challenge his audience to come up with their own interpretations of his remarks, and so achieve not only critical distance from their unreflective preconceptions but also open themselves to rethinking the conventionally exclusive distinction between mortal and immortal things.

In this latter respect, Heraclitus was the true precursor of Plato's Socrates. Both thinkers require the persons they engage with to follow their respective λόγος wherever it leads. Again like Socrates, Heraclitus revels in paradoxes, meaning controversions of standard opinions. To his great credit, he does not claim to know much in particular detail concerning cosmology, as some Presocratics will do in ways that, though highly imaginative, are little more than hand-waving by later scientific standards. More importantly, his riddling statements, in their balanced structure, rhythms, and measures, are a representation of the rationality he finds at work in the cosmos and, *mutatis mutandis,* in himself as the spokesman of its *logos.*[33]

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[33] This paper began life as my contribution to the discussions of Heraclitus which took place in the summer of 2005 as part of the *Symposium Philosophiae Antiquae Quintum,* organized by Apostolos Pierris. I am most grateful for his invitation to

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participate, and also to Dorothea Frede for giving me the further opportunity to present my views at the Hamburg conference on *Leib und Seele in der antiken Philosophie.* I thank the conference participants for their responses and also Andrea Nightingale and Chiara Robbiano, who sent me written comments on the paper. The version that appears here has previously been published in D. Frede & B. Reis (ed.), *Body and Soul in Ancient Philosophy* (Berlin 2009) 87–110.

8. On the physical aspect of Heraclitus' psychology[1]

With New Appendices

Gábor Betegh

The most significant and possibly most far-reaching novelty of Heraclitus' conception of the soul is a considerable extension of the ψυχή's role. As commentators have emphasized, in Heraclitus' aphoristic utterances the ψυχή emerges for the first time as an integrated center of motor, cognitive and emotive functions.[2] Heraclitus thus has a major role in the process through which the word ψυχή acquires the broad but fairly unified sense it has in the texts of the Classical and later periods. This novel characterization of the soul, moreover, is an integral part of what appears to be the general thrust of Heraclitus' entire philosophical project: a shift from an impersonal, objectivist description of the physical world, as practiced by his Milesian predecessors, to an approach in which questions about the nature of things in the world on the one hand, and reflections on the human being who is striving to understand the nature of things, and seeks to communicate his findings to other human beings, on the other hand, are intimately linked. In such a complex, epistemologically oriented and reflexive approach the center of cognition will naturally acquire a place of prominence; and Heraclitus takes ψυχή to be the center of cognition. The joint effect of these developments resulted in a new, and in a sense strikingly modern, conception of the self that has sometimes been compared to Thomas Nagel's "objective self."[3]

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[1] This paper has grown out of ideas I first presented at the Symposium Philosophiae Antiquae Quintum organized by Apostolos Pierris and then at the Jubilee meeting of the Southern Association of Ancient Philosophy in Oxford. A version was published in *Phronesis* 52 (2007) 3–32, which is reprinted here slightly revised. I added a series of appendices in which I present the discussions to which I referred to as "forthcoming" in the *Phronesis* paper. For the research contained here I received support from the ERC_HU BETEGH09 research grant. At the Symposium, Aryah Finkelberg read a paper (in this volume) that overlaps with my discussion at some points, although his main interest is in Heraclitean eschatology. I am grateful for the audiences in Ephesos and Oxford. Comments by David Charles, Christopher Gill, Katalin Farkas, Aryah Finkelberg, Charles Kahn, Tony Long, Stephen Menn, Malcolm Schofield, and David Sedley were particularly helpful. I owe much to discussions with Roman Dilcher. I would like to express my gratitude to David Sider for all his help with the present version.

[2] See especially M. Nussbaum, "Ψυχή in Heraclitus," *Phronesis* 17 (1972) 1–16, 153–170; and M. Schofield, M. "Heraclitus' theory of the soul and its antecedents," in S. Everson (ed.), *Companions to Ancient Thought.* Vol. 2: *Psychology* (Cambridge 1991) 13–34.

If this is the most momentous feature of Heraclitus' philosophical psychology, why should we bother too much with the seemingly less exciting physical aspect of his conception of ψυχή? The answer, I maintain, is that Heraclitus seems to hold at the same time that self-reflection and introspection, although important, are not sufficient to gain knowledge about the soul. The soul is integrated into the physical world, and reflections about the physical world can lead us to some crucial insights about the nature and working of the soul. Understanding the soul is the key to understanding human nature and the world, and the interrelation of the two; but, on the other hand, understanding the cosmic order and the major physical processes is vital to gaining knowledge about the soul.[4] Heraclitus thus appears to agree with the implication of Socrates' rhetorical question in the *Phaedrus:* "Do you think it is possible to understand the nature of the soul in a worthwhile manner without understanding the nature of the whole?" (*Phdr.* 270c1–2).[5] The soul is part of the whole, and cannot be properly understood without having a grasp on the way it is integrated in the physical world.

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[3] See A. A. Long, "Finding oneself in Greek philosophy," *Tijdschrift voor Filosofie* 54 (1992) 257–279; and C. Gill, "La psychologie présocratique: quelques questions interprétatives," in P.-M. Morel and J. F. Pradeau (eds.), *Les Anciens savants* (Cahiers Philosophiques de Strasbourg, 12). (Strasbourg 2001) 169–190. Because of all these considerations, it would probably be more appropriate to translate Heraclitus' ψυχή as "mind." I continue to render it as "soul" for reasons of convention.

[4] The fact that these two aspects of Heraclitus' philosophy cannot be severed has rightly been emphasized by Dilcher *H.* 53–54, with footnote 1 containing a criticism of Kirk's attempt to insulate the "cosmic fragments." Dilcher seems to start out by treating the cosmic aspect as secondary to the psychic (cf. e. g. p. 17), yet he eventually states that "[i]t is vital for the argument that man and cosmos illuminate each other's structure by this correspondence. Therefore, this double focus should not be imbalanced by giving priority to either side. (…) Both sides are equally essential" (93). I am in full agreement with these formulations, even though I disagree with specific parts of Dilcher's interpretation of Heraclitus' psychology, on which see below. See also the almost Heraclitean formulations in Long (above, n. 3) 271: "In disclosing truths about nature, Heraclitus is disclosing himself, or rather, in disclosing himself he is disclosing truths about nature; he is discovering the knower in the knowable and the knowable in the knower."

In what follows, I shall approach Heraclitus' views on the ψυχή from the side of its physical and metaphysical aspects. I shall concentrate first on the metaphysical framework which allows the soul's integration into the physical world and creates the conceptual space for its physical identification. Second, I shall turn to the physical characterization of the soul and to the way it is integrated into physical processes. In this part, I shall try to tackle the vexed question whether the soul for Heraclitus is fire or air, say something about the philosophical advantages of the option taken by Heraclitus, and briefly discuss Sextus' report of Heraclitus' psychology.

Finally, I should add a methodological point. It has sometimes been urged that because of Heraclitus' mode of expression, the intentional obscurity of his pronouncements and his apparent refusal to expound his views in continuous, argumentative prose, the interpreter ought not try to impute a clear-cut doctrine or theory to him. I would certainly agree that the interpreter has to show the utmost sensitivity to the formal, literary and linguistic features of the Heraclitean fragments. Yet I would still not renounce the idea that Heraclitus by his pronouncements expressed a set of fairly worked out and specific views about the topics he dealt with. The celebrated B 93 states that "the lord whose oracle is the one in Delphi neither declares nor conceals, but gives signals" (ὁ ἄναξ οὗ τὸ μαντεῖόν ἐστι τὸ ἐν Δελφοῖς οὔτε λέγει οὔτε κρύπτει ἀλλὰ σημαίνει) and this statement has customarily been taken to describe Heraclitus' own mode of expression as well. But the implication of the apophthegm is neither that Apollo does not have a clear and specific view on the matter at hand, nor that the recipient should renounce discovering what the lord of the oracle thinks about the matter—even if one cannot hope to arrive at a definitive answer and dissipate all ambiguity.

I

B 36 is the central fragment for locating the soul's place in physical processes:

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[5] Ψυχῆς οὖν φύσιν ἀξίως λόγου κατανοῆσαι οἴει δυνατὸν εἶναι ἄνευ τῆς τοῦ ὅλου φύσεως;

ψυχῇσιν θάνατος ὕδωρ γενέσθαι,
ὕδατι δὲ θάνατος γῆν γενέσθαι,
ἐκ γῆς δὲ ὕδωρ γίνεται,
ἐξ ὕδατος δὲ ψυχή.

For souls it is to die to become water,
for water it is to die to become earth,
from earth water is being born,
from water soul.

The first remarkable point about this fragment is that soul appears here together with two main elemental masses, water and earth, in such a way that soul seems to be treated on a par with the two physical stuffs. This observation may appear obvious, but will receive some refinement later. The statement links the three terms, soul, water, and earth, by specifying the way they transform into each other so that the series of changes creates a cycle. That the focus is on the changes, and not merely on the states, becomes especially evident when we realize that the word θάνατος refers not to the state of being dead, but to the event of dying. Apart from philological considerations,[6] this rendering is strongly recommended in this case by the fact that Heraclitus explains θάνατος by the verb γενέσθαι. I try to indicate this fact by translating θάνατος by the infinitive "to die," instead of the more usual noun "death." The translation "is being born" in the latter part of the fragment tries to capture the continuous aspect of the present indicative γίνεται and the contrast with the aorist γενέσθαι.

The use of the terms "to die" and "is being born" to describe the transformations between soul and water and water and earth is doubly provocative. First, it is challenging to apply these terms to stuffs like water and earth that are usually considered lifeless. Second, it is possibly even more intriguing to speak about the "dying" and "birth" of the soul. Surely, the ψυχή has strong connections to life in the traditional, Homeric, conception—so much so that it is customarily called in the literature "the organ of life." Yet in the traditional conception it is not the ψυχή that does the living, but the organism is thought to live as long as the ψυχή is present and active in it. Correspondingly, it is the organism, not the ψυχή, which dies when the ψυχή departs from it.[7] Similarly, it is highly unusual to speak about the birth of the ψυχή as such, distinct from the organism it is part of—just as we would not normally speak about the birth of either the mind or the brain as such.[8]

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[6] E. Hussey, "Heraclitus on living and dying," *The Monist* 74 (1991) 518–519 gives a very helpful concise review of the Homeric and Hesiodic occurrences of the word θάνατος. By this overview Hussey seeks to show, to my mind successfully, that θάνατος usually refers not to a state but to a process or event, and should hence be translated by 'dying' rather than 'death.' Hussey does not discuss B 36, which he thinks originally consisted only of the four words ψυχῇσιν θάνατος ὕδωρ γενέσθαι (529, n. 18), which he translates as "It is death to souls to become moist."

The interpreter can respond to these challenges by depleting the significance of the words "dying" and "being born" to arrive at the innocuous meanings "cease to exist" and "come into being." The more interesting alternative, however, is to accept that Heraclitus attaches (some form of) life to stuffs that are not usually conceived as living. When this latter option is taken, it becomes significant that the formulation of the cycle is not symmetrical. Describing the way down, from ψυχή to water, from water to earth, Heraclitus speaks about "dying" into the next phase of the process, whereas on the way up, from earth to water, from water to ψυχή, he does not mention dying, only becoming or birth (γίνεται). When, on the way down, souls transform into water, the souls die and this is how water comes into being (or is born). When, on the way up, water transforms into soul, soul comes into being and is born. By this transformation water ceases to be—but I doubt that Heraclitus would describe the same transformation as the dying of water; water dies only on the way down, when earth is born from it, but not on the way up, when it is transformed into soul. Dying characterizes the way down.[9]

Incidentally, if it is true that only things that live can die, ψυχή in Heraclitus ceases to be the bearer of life. For water is distinct from ψυχή, yet it has to have some form of life if it is to die when earth comes into being from it.

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[7] This has been excellently brought out by Nussbaum (above, n. 2). For the same point in Plato, see F. Karfík, *Die Beseelung des Kosmos: Untersuchungen zur Kosmologie, Seelenlehre und Theologie in Platon Phaidon und Timaios*. Leipzig and Munich, 2004. For further elaboration on this point, see Appendix 1.

[8] See Appendix 2.

[9] B 36 has many variants and paraphrases, fourteen listed in Marcovich *H.* ad loc. (his fr. 66). Among these, there are only three that speak about dying on the way up as well: Plut. *de E* 392c; Marc. Ant. 4.46.1, and Max. Tyr. 41.4, all three listed by Diels under B 76. I agree with those commentators like Marcovich *H.* ad loc., Kahn *H.* ad loc., and Dilcher *H.* 67 n. 1, who take these to be (Stoicizing) paraphrases; *contra* J.-F. Pradeau, *Héraclite: Fragments* (Paris 2002) 284–285, 296.

The wording of the fragment shows a further notable point. The first and last words of the sentence refer to soul. This is clearly an indication of the cyclical nature of the transformations captured in the fragment. There is a difference, however. In its first occurrence, the word is in the plural, whereas in the second it is in the singular. In the following analysis, I shall assume that this shift from plural to singular is significant;[10] I base it on the conviction that Heraclitus uses language with utmost care and his formulations show a remarkably high level of consciousness. The shift from plural to singular shows, first of all, that when we get to the end of the sentence we have not as yet made the full circle of the cycle of transformations. To close the circle, we still need to get to the plural ψυχαί from the singular ψυχή. As we shall see, much hangs on the way we account for the difference between the plural and the singular form, and how we conceive of the process that leads from the singular ψυχή to the plural, individuated ψυχαί. We may ask, for example, what type of process is the one that delivers plural ψυχαί from the singular ψυχή? Does it already involve a measure of "dying" as the processes on the way down? Or is it primarily an event of "birth" as is characteristic for the processes of the way up? Or is it a completely different type of process?

Moreover, this difference between singular and plural calls attention to a semantic feature that may have important metaphysical bearings. The terms "water" and "earth" refer in the fragment to elemental masses, and correspondingly function as mass terms (or non-count nouns as linguists prefer to call them).[11] They do not refer to individuated things with definite borders but to stuffs. The plural ψυχαί is all the more significant because it shows that Heraclitus here uses the term ψυχή as a count noun—just as we would expect, because we are accustomed to think about souls as individuated entities. This means that we should qualify our preliminary contention that Heraclitus treats soul on a par with water and earth: not quite, because the word "souls" refers to individuated things, whereas "water" and "earth" refer to stuffs. We can accordingly pinpoint a difference between the first two phases of the series of transformations. The first phase refers to the process through which souls conceived as individuated things lose their identities and cease to exist as they dissolve in an unindividuated stuff, water. The second phase in contrast refers to a process in which some part of water is transformed into another stuff, earth.

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[10] See also Finkelberg in this volume.

[11] Admittedly, "count noun" and "non-count noun" or "mass term" are our categories. Yet these linguistic categories clearly apply to Greek as well (cf. K-G 2.15–16 on the use of Stoffnamen, and the way they can be used in the plural).

But what about the singular ψυχή, with which the fragment ends? I would maintain that at the end of the sentence ψυχή is used as a mass term, much like water and earth, and not as a singular count noun standing for a class of things, souls. If it were not so, Heraclitus could have used the plural here as well. I assume, therefore, that what is described in the last colon of the sentence is not the way individuated souls are born from water but rather the way some part of water is transformed into another stuff, soul. The death of individual souls in the first colon of the fragment may or may not correspond to the death of individual human beings, depending on whether Heraclitus believed in the post mortem survival of individual souls—a question on which I would suspend judgement.[12] The birth of soul in the last part of the fragment, in contrast, does not refer to the birth of individual human beings but to the way soul stuff is generated.[13] The missing link in the cycle, the shift from the singular ψυχή to the plural ψυχαί, is the way we get individuated souls from soul stuff.

The idea of using "soul" or "mind" as mass terms, and the corresponding idea of conceiving soul or mind as stuffs, is quite alien for us. Yet it was not so in archaic and later philosophical texts. As I cannot provide a detailed survey of the relevant texts within the limits of the present paper, let me only mention some notable examples. Anaxagoras clearly uses the word νοῦς as a mass term when he says in B 12 ad fin. "mind is all alike, both the larger and the smaller [of it]" (νοῦς δὲ πᾶς ὅμοιός ἐστι καὶ ὁ μείζων καὶ ὁ ἐλάττων).[14] Similarly, when Diogenes of Apollonia maintains in B 4 that "human beings and the other animals live by means of the air as they breathe. And this is for them both soul and intelligence" (ἄνθρωποι γὰρ καὶ τὰ ἄλλα ζῷια ἀναπνέοντα ζώει τῷ ἀέρι. καὶ τοῦτο αὐτοῖς καὶ ψυχή ἐστι καὶ νόησις) he treats air as a stuff that enters the body with breathing, but which, on the other hand, functions as soul and intelligence in us. It is more striking to see that Socrates, in both Xenophon and Plato, entertains a similar conception of soul and mind. In the *Memorabilia*, Socrates tries to corner the irreligious Aristodemus by the following salvo of questions:

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[12] For the most recent defence of the survival of individual souls, see Finkelberg in this volume.

[13] The shift from the plural to the singular must pose a problem also for interpreters like Marcovich *H.* 362 and Dilcher *H.* 67–69, who take the fragment to refer exclusively to processes within human beings. If the fragment describes the "microcosmic cycle" within the living human being, it is unclear to me why it speaks about the death of souls in the plural and then switches to soul in the singular. Dilcher thinks that the only alternative to the microcosmic interpretation is eschatological, one that ascribes to Heraclitus the view that the soul first leaves the body, lingers around for a while and then dies into water. It may well be that the first phase of transformation, from souls to water, happens within the human being, but that does not oblige us to say that all the transformations described in the fragment occur within the "microcosmos": the fragment speaks about these transformations in general terms. For a critique of Marcovich's physiological interpretation, see Schofield (above, n. 2) 15–21. Kirk *H.* 341—followed by Marcovich *H.* 361—states that even if the main thrust of the fragment would suggest that ψυχή stands for cosmic fire, parallel to the other two cosmic masses, the plural ψυχαί rules this out. I agree that to be the case at the beginning of the fragment, but nothing hinders that things change with the second, singular, occurrence of the word.

> Do you think you have some intelligence (φρόνιμον),[15] but there is nothing intelligent anywhere else at all? And this, when you know that you have in your body only a tiny measure of earth which is so huge, and a little bit of the large extension of waters, and that your body was constructed by receiving only a minute portion of all the other things which, surely, exist in great quantities? But as to mind (νοῦς), which is thus the only thing that does not exist anywhere else, you think you managed by some happy chance to snatch it, and you believe that those immensely great and infinitely many masses are in such a well-ordered state due to something lacking intelligence? (1.4.8)

Just as our bodies contain some measure of the stuffs earth and water, we also have a measure of mind in us. Much like Anaxagoras, Xenophon's Socrates treats "mind" as a mass term that we can have a measure of. Plato's Socrates develops a strikingly similar argument in the *Philebus* to the effect that just as fire, earth and other material components of us come from, and are nourished by, the respective cosmic masses, so our soul comes from its cosmic counterpart.[16] Finally, we can think of the *Timaeus* as well, where the imagery of soul stuff, its mixing, moulding, and portioning by the Demiurge is particularly conspicuous.

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[14] So also S. Menn, *Plato on God as Nous* (Carbondale 1995) 26: "We may begin by recalling the undeniable fact that Anaxagoras uses *nous* as a mass term." Menn argues that expressions like νοῦν ἔχειν are not Greek for 'have a mind' but rather for something like 'have reason' or 'be reasonable," so that *nous* for Anaxagoras and other authors is reason (a mass term) and not mind (a count noun). My point is rather that Anaxagoras—just as some of his predecessors, contemporaries, and successors—could use words like νοῦς and ψυχή as both count-nouns and mass terms. I shall continue to translate νοῦς as 'mind' even if the English word cannot capture this double usage.

[15] My translation follows the text in M. Bandini and L.-A. Dorion, *Xénophon: Mémorables*. Vol. 1, Paris 2000, who, following Muretus, based on Bessarion's Latin version, delete the words ἐρώτα γοῦν καὶ ἀποφρινοῦμαι.

The gist of what I have said about Anaxagoras, Diogenes of Apollonia, and Socrates' argument in the *Memorabilia* may be present already in Anaximenes. The only relevant text is B 2: οἷον ἡ ψυχή, φησίν, ἡ ἡμετέρα ἀὴρ οὖσα συγκρατεῖ ἡμᾶς, καὶ ὅλον τὸν κόσμον πνεῦμα καὶ ἀὴρ περιέχει ("Just as our soul, which is air, keeps us together, so do the breath and air encompass the whole world"); yet the wording, authenticity and interpretation of this fragment is too contested to draw any firm conclusions.[17]

From the point of view of terminology, these passages are largely incongruent as they speak about ψυχή, νοῦς, φρόνιμον, and νόησις. What connects them is the underlying metaphysical assumption according to which that which is the bearer of mental functions in us is a stuff that occurs also elsewhere in the world in smaller and larger quantities. Human beings show mental functions, and live, in so far as they have a share in that stuff. In this respect ψυχή and νοῦς are like other elemental constituents in us, and can be used as mass terms just like "fire" or "earth." ψυχή and νοῦς at the same time function as count nouns in the same texts in referring to individuated portions of ψυχή and νοῦς stuff.

A possible corollary of this approach is that the stuff in question does not need to be in a human, or animal, body to show mental functions. More exactly, if a theorist wants to hold that this stuff shows mental functions only when it is in a human (or animal) body, he needs to provide specific reasons why this should be so.[18] A further corollary is that the cosmic mass of soul (or mind) can be assigned cosmological roles because it can also be described as the greatest individuated portion of soul, or mind, stuff. Indeed, from this aspect the cosmic mass of this stuff can function as a cosmic divinity. The ambiguity between an elemental mass and a corresponding cosmic god is a familiar phenomenon that we can observe for example in the cases of Oceanus and Gaia, or water and earth. The characteristics of this cosmic god will be those that we assign to soul, or mind, in a human being: control, motor and cognitive functions and so forth.

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[16] *Phlb*. 29a-30d, esp. 30a about the soul. The relationship between the arguments in the *Memorabilia* and the *Philebus*, and the possibility that they go back to the historical Socrates, are interesting questions that cannot be discussed here. See D. Frede, *Platon*. 3.2. *Philebos* (Göttingen 1997) 215 n. 183 and D. Sedley, *Creationism and Its Critics in Antiquity* (Berkeley 2007) 82, 217–19.

[17] The most detailed discussion of this fragment is in K. Alt, "Zum Satz des Anaximenes über die Seele: Untersuchung von Aetios Περὶ Ἀρχῶν," *Hermes* 101 (1973) 129–164, who concludes that it has mistakenly been attributed to Anaximenes. For a much more optimistic view, see, e.g., A. Laks, "Soul, sensation, and thought," in A. A. Long (ed.), *The Cambridge Companion to Early Greek Philosophy* (Cambridge 1999), esp. 252. Schofield (above, n. 2) 23–24 provides a balanced assessment of the fragment and compares it to Heraclitus' views on the soul. See also below, Appendix 3.

[18] Aristotle makes this point explicit in *De An*. 1.5 411a8–23.

It is time to come back to Heraclitus. By analyzing B 36, I hope to have been able to make a case for the point that the fragment starts out by speaking about individual souls, but ends in speaking about soul conceived as a stuff. A very brief historical survey has shown that such a conception is fully in line with some representative theories of the archaic and classical periods. This constitutes the general metaphysical framework for the physical interpretation of the Heraclitean soul. B 36 indicates that Heraclitus agrees with those who think that soul can transform into other stuffs, but apparently stands apart in describing that process in terms of "dying." The central questions that have emerged from the preceding discussion are the following: (Q1) *What is ψυχή in physical terms?* and (Q2) *How can we conceive the shift from soul to souls?*

II

A number of fragments show that Heraclitus, in conformity with what the metaphysical framework allows, ascribes mental functions and characteristics not only to human beings, but to natural cosmic phenomena as well. If there is a stuff that intrinsically shows mental functions, it will show mental functions also when it is not in a human body. In B 118 Heraclitus states that "A gleam of light: dry soul, the wisest and the best" αὐγὴ ξηρὴ ψυχὴ σοφωτάτη καὶ ἀρίστη.[19] A natural phenomenon—that can be a beam of sunlight or a thunderbolt—is identified as soul, and described in superlative epistemological and ethical terms. When in B 64 Heraclitus asserts that "The thunderbolt steers these things, all of them" τάδε πάντα οἰακίζει κεραυνός), he ascribes to the thunderbolt the governing, coordinating function that other fragments (e.g. B 117) assign to the human soul. If we accept that the rhetorical question in B 16 "How will one escape the notice of that which never sets?" (τὸ μὴ δῦνόν ποτε πῶς ἄν τις λάθοι;) refers to cosmic fire,[20] we can see that Heraclitus also ascribes (some form of) cognition to the cosmic mass of fire.

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[19] The philological arguments marshaled by J. Bollack and H. Wismann, *Héraclite ou la séparation* (Paris 1972) 325–327, who show, I think conclusively, that the subject of the sentence is αὐγή and the predicate is ψυχή, qualified by the adjective ξηρή.

What is common in these fragments is that psychic functions are attributed to fire or fiery things in natural phenomena. But does this entail that ψυχή is simply to be identified with fire? The standard interpretation holds that this is so, whereas the alternative interpretation, championed in the most developed form by Charles Kahn, maintains in contrast that ψυχή is, or is primarily, air.[21] Note that this interpretative choice has important bearings on my overall thesis about the metaphysical framework. For if it is true that the human soul is air, while the bearer of psychic functions on the cosmic side is fire, then it is a serious threat to my whole story about explaining mental functions in human beings by saying that we have a share of the stuff that has mental properties in general and also on the cosmic scale.

The question of the material identification of the soul, whether it is fire or air, is intimately bound up with the question whether or not Heraclitus' theory of elemental masses included air as a distinct stage in the cycle of transformations. We have seen that B 36 mentions only three stages in the cycle: soul, water, and earth. Fragments such as B 30 and 90, together with the entire doxographical tradition starting with Aristotle, make it certain that fire had a place of prominence in Heraclitus' teaching, and thus clearly secure the place of fire.[22] To this we can also add B 31a: πυρὸς τροπαὶ πρῶτον θάλασσα, θαλάσσης δὲ τὸ μὲν ἥμισυ γῆ, τὸ δὲ ἥμισυ πρηστήρ ("turnings of fire: first sea, of sea half earth, the other half *prêstêr*").

This fragment, just like B 36, speaks about the transformations linking cosmic masses and phenomena. The transformations in this case are not described as dying and being born, but referred to as the turnings (τροπαί) of fire. Moreover, accepting that πρηστήρ, notoriously difficult to translate, refers to some fiery atmospheric phenomenon,[23] we have yet again a cycle in which the first and last terms are closely related but are not quite identical. Earth is common to B 31a and 36, whereas seawater in B 31a refers to the cosmologically most prominent part of water mentioned in B 36.

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[20] Cf., e.g., Kahn *H.* 274–275.

[21] See Kahn *H.* 238–240. Kahn's view has been accepted also by T. Robinson, *Heraclitus: Fragments* (Toronto 1987) 104–105.

[22] It is an interesting but rarely remarked fact that not all ancient sources agreed that fire is Heraclitus' principle. Cf. Cicero *ND* 3.35: *sed omnia vestri, Balbe, solent ad igneam vim referre, Heraclitum ut opinor sequentes, quem ipsum non omnes interpretantur uno modo*. Aenesidemus, for example, took air to be Heraclitus' principle. Cf. S.E. *M.* 10.233, with discussion in R. Polito, *The Sceptical Road: Aenesidemus' Appropriation of Heraclitus* (Leiden 2004) 154–161.

All these fragments seem to deliver a coherent image according to which the third element beside water and earth is fire. The word ἀήρ only occurs in the different variants listed under B 76, of which I quote here only the version transmitted by Maximus Tyrius:[24] ζῇ πῦρ τὸν γῆς θάνατον καὶ ἀὴρ ζῇ τὸν πυρὸς θάνατον, ὕδωρ ζῇ τὸν ἀέρος θάνατον, γῆ τὸν ὕδατος ("Fire lives the dying of earth, and air lives the dying of fire; water lives the dying of air, and earth that of water").

This text, however, has customarily—and I think with good reasons—been described as a Stoicizing paraphrase of B 36.[25] Shall we conclude, then, that air is missing from Heraclitus' system altogether? Against such a conclusion, some powerful arguments have been raised. To begin with, it is unclear how one could claim that water immediately turns into fire in B 36.[26] Moreover, I think that Charles Kahn is simply right in insisting that Heraclitus "cannot have offered a theory of the natural world in which the atmosphere was omitted."[27] And this is especially so, I would add, for someone writing after Anaximenes, who made air his principle, and Xenophanes, who was pre-eminently interested in various atmospheric phenomena and clouds. Simply ignoring what he does not agree with is, I think, wholly uncharacteristic of Heraclitus. It remains true, on the other hand, that the relevant fragments consistently list only three stages in the cycle, and I do not think that adherents of the four element interpretation of Heraclitus have been able to address this question in a satisfactory way. The ideal solution should be able to account for the fact that Heraclitus prefers to speak about three terms in the processes of transformation without, however, excluding atmospheric air. But how could that be done if the places of fire, water, and earth have already been secured?

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[23] For arguments for this view, see e.g. Kirk *H.* 330–331.

[24] The word ἀήρ is missing from Marcovich's index verborum. Other versions of B 76 are in Plut. *De E* 392 C and Marc. Ant. 4.46.

[25] So also Kahn *H.* 153. Note that different versions of B 76 are much less carefully formulated than B 36. They do not indicate the cycle by ending the fragment with (a version of) the first word as B 36 does and do not indicate the chain of transformations by always repeating the outcome of the previous process which becomes the starting point of the next phase of transformation. Instead, Marcus Aurelius adds the words καὶ ἔμπαλιν at the end of the fragment. Remarkably, Plutarch's version has only three terms, fire, air and water, as he omits earth. Note also, that if the version of Maximus Tyrius, or that of Marcus Aurelius, is genuine, it invalidates the observations I have made above about 'dying' being characteristic of the way down. This is however not true of Plutarch's version, which preserves this aspect of B 36.

[26] One might refer to instances when a liquid, such as the oil in a lantern, is burning, and this is how fire "is being born" from something liquid. But then one should just as well refer to cases when something solid, earth-like, such as wood or coal, is burning.

[27] Kahn *H.* 140.

When we come to the more specific question whether the human soul is air or fire, *prima facie* it seems more probable that it is to be identified with fire. First of all, we have just seen that fiery phenomena, such as a gleam of light and the thunderbolt, have psychic functions. There is also the force of analogy with other ancient theories. In all other early, and not so early, theories, when there is a primary form of matter, the ψυχή, or the bearer of the most important psychic faculties, is identified with that form of matter.[28] This interpretation can also align some ancient doxographical reports on its side.[29]

Yet, once again, the alternative view can refer to some ancient interpretations, including that of Philo of Alexandria.[30] Just as important, it can also present some powerful internal arguments supporting the view that soul is air and not fire. First of all, there are fragments in which we hear about wet souls, such as the soul of the drunken man in B 117: ἀνὴρ ὁκόταν μεθυσθῇ, ἄγεται ὑπὸ παιδὸς ἀνήβου σφαλλόμενος, οὐκ ἐπαΐων ὅκη βαίνει, ὑγρὴν τὴν ψυχὴν ἔχων ("A man when he is drunk is led by a beardless boy, staggering, not knowing where he steps, having his soul wet.”).

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[28] Some further arguments of less force have also been adduced. For example, G. Vlastos, "On Heraclitus," *AJP* 76 (1955) 364–365, referred to the observable fact that the living body is warm whereas the corpse is cold. This, however, is not based on any of the surviving texts of Heraclitus. KRS 204, on the other hand, state that while Anaximenes built on the Homeric view of the ψυχή being some kind of breath, "Heraclitus abandoned this idea in favour of another popular conception of the soul, that it was made of fiery aither." I was unable to find any clear evidence for such an assumedly popular conception prior to Heraclitus.

[29] Theodoret. *Gr. aff. cur.* 5.18 Παρμενίδης δὲ καὶ Ἵππασος καὶ Ἡράκλειτος πυρώδη ταύτην (sc. τὴν ψυχήν) κεκλήκασιν.

[30] Philo, *De Aet. Mundi* 21 quotes the first part of B 36 and then states that: ψυχὴν γὰρ οἰόμενος εἶναι τὸ πνεῦμα τὴν μὲν ἀέρος τελευτὴν γένεσιν ὕδατος κτλ. Aenesidemus also thought that the soul is air for Heraclitus. On this point, see below.

The controlling, motor functions of the drunken man’s soul are severely impaired because his soul is wet. The question naturally arises how could Heraclitus maintain both that the ψυχή is fire and that it can get wet? Answering this objection by claiming that in such cases part of the soul dies does not quite convince.[31] For B 117 speaks not about someone who has a reduced-size fiery ψυχή, because part of his soul has died, but someone who has a wet ψυχή. Replace ψυχή with its assumed physical description, fire, and we are back to the absurd idea of wet fire. Consider also B 77: ψυχῆσι τέρψιν μὴ θάνατον ὑγρῇσι γενέσθαι (“for souls it is pleasure, not dying, to become moist”).

This fragment, preserved by Porphyry quoting Numenius, has often been considered spurious or corrupt. Marcovich, for example, treated it only as a reaction to B 36. Many others have retained it, but offered various emendations. So some have bracketed μὴ θάνατον as an interpolated gloss.[32] Another option, offered by Diels and followed by numerous scholars, is to emend the transmitted μή to ἤ, with the result that becoming wet is pleasure or death for souls. The motivation for emending this otherwise well transmitted and intelligible text is clear: editors and interpreters have tried to harmonize B 77 with B 36 on the assumption that becoming wet is death for souls. But as Jaap Mansfeld has pointed out in his defense of the transmitted wording of B 77, ὑγρῇσι γενέσθαι, “becoming wet,” is not the same as ὕδωρ γενέσθαι, “becoming water.”[33] And the same point applies also to the drunken man’s soul in B 117. When the soul becomes moist or wet, it approaches water without becoming water as yet; it approaches dying without dying as yet. Thus B 77 in its transmitted form is perfectly compatible with both B 36 and 117—but only if soul is something that can become wet, which fire surely cannot do.

The discussion in this section adds two further questions to the list started at the end of the previous section: (Q3) *How can we find a place for air in a system that apparently counts with only three major cosmic masses?* and

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[31] See Schofield (above, n. 2) 29: “When the soul becomes moist or wet its fire is put out—it dies (fr. 36) either entirely or in part, as in drunkenness, fr. 117, or in sleep, fr. 26. On the interpretation of ψυχή as fire Heraclitus does not need to be seen as committed to the absurd concept of wet fire.”

[32] So, e. g., O. Gigon, *Untersuchungen zu Heraklit* (Leipzig 1935) 106.

[33] J. Mansfeld, “Heraclitus on the psychology and physiology of sleep and on rivers,” *Mnemosyne* 20 (1967) 9.

(Q4) *How could we account for the fact that some manifestations of ψυχή for Heraclitus are fiery whereas others are wet?*

III

When we contrast the terms of the modern discussion about the physical identification of the Heraclitean soul with the earliest and most detailed ancient testimonies, one point becomes striking. The earliest accounts do not identify the Heraclitean ψυχή with either air or fire, but say that soul, for Heraclitus, is exhalation (ἀναθυμίασις).[34] And they do so even when one would really expect them to identify soul as one of the elements. This is a conspicuous feature of Aristotle's account of the physical characterization of the Heraclitean soul in *De Anima* 1.2:

> Diogenes, like some others, [held the soul to be] air because he believed it to be the most finely grained and the principle; this is the reason why the soul knows and moves, in so far as it is primary, and the other things are from this, it knows; in so far as it is the most finely grained, it originates movement. Heraclitus says too that the principle is soul, since it is the exhalation from which the others are composed. (*De An.* 1.2 405a21–6)

Aristotle is entirely happy in this context to say that for Diogenes the soul is air, just as for Democritus spherical atoms, for Hippo water, for Empedocles the organ of cognition is a mixture of the four elements. He even says that for Heraclitus, just as for Diogenes, ψυχή is the principle—what he does not say is that it is fire, even though elsewhere (e.g. in *Meta.* 1.2 984a7 = Her. A 5 DK) he identifies Heraclitus' principle as fire. On the other hand, he does not say that soul for Heraclitus is air, even though it would have been quite an obvious move considering that he is just pointing out the strong parallels between Heraclitus and Diogenes on the question of the material identification of ψυχή. Aristotle could jolly well identify Heraclitus' soul with either air or fire in this context, but he did not do so. Instead, he said that soul for Heraclitus is exhalation.[35]

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[34] Arist. *De An.* 1.2 405a24; Aet. 4.3.12.; Cleanth. apud Ar. Did. fr. 39.2 Diels = Her. B 12.

[35] This feature of Aristotle's testimony has clearly caused some uneasiness for Kirk. After having quoted Aristotle, he continues by saying that "This occurs in a context in which Aristotle is anxious to find a common term for soul and ἀρχή…; by ἀναθυμίασις here he means a kind of fire, but has deliberately chosen a vague term for it" (Kirk *H.* 275). But why would Aristotle prefer to use a vague term in this context, where fire or air would clearly better suit his purposes?

At this point, I need to discuss very briefly what Aristotle may have meant when he stated that soul for Heraclitus is exhalation. Exhalation is a central concept in ancient meteorology in general, but is particularly important in Aristotle's theory. Indeed, Aristotle explained most atmospheric and meteorological phenomena by taking exhalations to be the material cause of these phenomena.[36] Aristotle famously distinguished between two kinds of exhalation, dry and moist, both starting from the earth.[37] Dry exhalation arises from the earth heated by the sun and reaches up to the fiery sphere in the sky, situated between the sphere of air and that of aither. Moist exhalation, in contrast, arises from the water in and on the earth and, being heavier, rises only up to the sphere of air (*Mete.* 1.3). On this view, then, exhalations extend from the level immediately above the earth, through the layer of air, up to the uppermost fiery region which is contiguous with the divine aither. Moreover, different fiery phenomena in the sky, such as shooting stars, lightning, "torches" (δαλοί), and "goats" (αἶγες), are explained as ignition of dry exhalations.

Clearly, not all of Aristotle's own theory of exhalations can be ascribed to Heraclitus. To begin with, Aristotle's insistence that exhalations arise from earth is in obvious contrast with what we have seen in B 36: if Heraclitus' ψυχή is indeed exhalation, this exhalation must arise from water and not from earth. B 31a, quoted above, also implies that transformations to and from earth must go through a liquid state of matter, water or sea, and that the fiery atmospheric phenomenon of πρηστήρ again comes from water/sea and not earth.

A further complication comes from Diogenes Laertius' doxographical report in 9.9–11, going back to Theophrastus, according to which Heraclitus had not only a bright exhalation arising from the sea and nourishing the sun, but also a dark exhalation coming from the earth so that this dark exhalation produces the darkness of night and winter. But as Kirk (1954) 270–6 has, to my mind, convincingly shown, the ascription of an earthly exhalation to Heraclitus is the result of some confusion with the Aristotelian theory.[38] The main objection to Diogenes' report, I think, is the same as above: the fragments that speak about the transformations between elemental masses show that earth only transforms into water and then water transforms into further fiery atmospheric phenomena and ψυχή. Diogenes' testimony, on the other hand, contains an additional piece of information, not mentioned by Aristotle. Diogenes says that the celestial bodies are bowls (σκάφαι) in which some part of the exhalation coming from the sea is burning.[39] This doctrine corresponds to the idea that exhalations extend from the mist lingering on the surface of waters to the fiery phenomena in the upper sky.

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[36] For the most recent comprehensive discussion, see L. Taub, *Ancient Meteorology* (London 2003) 88–92.

[37] There is a discussion in the literature whether both exhalations are hot, or the moist exhalation is cold, but this point does not need to concern us here.

[38] We encounter a further level of confusion in Aëtius 2.17.4 = Her. A 11 DK, who says that it is the exhalation coming from the earth that nourishes the

Retaining the core of Aristotle's testimony, but stripping off what is incompatible with what we find in Heraclitus' original fragments, we get that ψυχή for Heraclitus is the exhalation that rises from water extends to the sky and the fire of the celestial bodies.[40] The first part of this conclusion is reinforced by the apparently independent information provided by Cleanthes, preserved by Arius Didymus, that, according to Heraclitus, "souls, too, come out of moisture by exhalations" καὶ ψυχαὶ δὲ ἀπὸ τῶν ὑγρῶν ἀναθυμιῶνται, Ar. Did. fr. 39.2 Diels = Her. B 12), whereas the connection between ψυχή and stellar matter, is supported by the testimonies of Macrobius and Galen.[41]

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stars, even though in 2.20.16 he says that the sun is nourished by the exhalation arising from the sea, and in 2.28.6 he says that both the sun and the stars are nourished by the bright exhalation coming from the sea. The idea that the stars are nourished by dark exhalations is also contradicted by D.L. 9.10. One may wonder whether this confusion comes from that part of the doxography that connects the dark exhalations with night.

[39] Kirk *H.* 269–279 and Kahn *H.* 291–293 come to opposite conclusions about the different elements of the Theophrastean doxography. For Kirk, the doctrine of celestial bowls is a secure piece of information, because "this is such an unusual idea, so different from the sort of thing which would be invented by Theophrastus" (270), whereas in Kahn' view one must suspend judgment on the authenticity of the doctrine of σκάφαι. Kirk, on the other hand, tries to refute the double exhalations, whereas Kahn says that this is "what seems most authentic in Theophrastus' report" (*H.* 293). As should have become clear, on the assessment of this part of the doxography in D.L., I tend to side with Kirk.

[40] In a way, the line of interpretation I am taking is closest to the one proposed by Robert B. English in a paper published in 1913: "Heraclitus and the soul," *TAPA* 44 (1913) 163–184. English's paper, as far as I am aware, is completely ignored in more recent discussions.

[41] Macr. *S. Scip.* 14.9 = Her. A15: *(animam) scintillam stellaris essentiae.* Galen 4.786 Kühn, not in DK. For the possible eschatological implications of this doctrine, see Finkelberg in this volume.

If we accept that Aristotle, our earliest doxographical source on Heraclitus' psychology, was basically correct in saying that ψυχή is exhalation for Heraclitus, we get clear and coherent answers to three of the questions I have formulated above. Let us start with (Q1): *What is ψυχή in physical terms?* The ψυχή is all states of matter covered by exhalations from the lowest level of atmospheric air to the uppermost layer of celestial fire. This general answer in turn effortlessly offers solutions to the two puzzles raised at the end of section 2: (Q3) How can we find a place for air in a system that apparently counts with only three major cosmic masses? If we accept that ψυχή, one of the three terms of the cyclical transformation described in B 36, covers the whole spectrum of matter covered by exhalation, then this term will include celestial fire, all kinds of fiery phenomena and atmospheric air. On the interpretation that follows Aristotle's testimony, it is correct both to say that Heraclitus distinguished three main cosmic masses and to accept that he did not ignore atmospheric air. Moreover, because the phenomenon of exhalation produces a gradual shift in the different physical properties of matter (from wet to dry, from cold to hot, from dark to bright), the entire cosmic region from the lowest part of atmospheric air to heavenly fire forms a continuum. That there is no such clear borderline between air and fire as there is between air and water or water and earth can receive some empirical justification. In the language of B 36, it means that the continuum extending over the range of exhalation is not punctuated by "death" and "birth," whereas in the language of B 31a, we can say that the gradual shift from fire to atmospheric air does not involve a "turning." Of course, a more refined analysis can distinguish a variety of different states of matter and phenomena within this spectrum: mist is not the same as the thunderbolt, a cloud is not πρηστήρ or αὐγή, and so forth.

Note also that it is not specific to ψυχή, understood as exhalation, that it designates one basic mass of matter within which different parts can be distinguished. The cosmic mass of water comprises brine, the fresh waters of springs, rivers and lakes, while the cosmic mass of earth can be analyzed into sand, soil, rock and so forth. This point makes it easier to understand the apparent inconsistency between the terms of B 36 and 31a. Earth is common to both, but in the case of the remaining two terms B 36 speaks about the more general, comprehensive cosmic masses (ψυχή and water), whereas B 31a mentions only the cosmologically, or cosmogonically, more important parts of these masses (fire and sea).

The above answer to (Q3) immediately provides a solution to (Q4) as well: *How could we account for the fact that some manifestations of soul for Heraclitus are fiery, whereas others are wet?* We have just seen that within the range of matter covered by exhalation, there are misty, foggy, wet parts, but drier, brighter and fierier parts as well. Indeed, it is the basic idea behind the concept of exhalation that it connects qualitatively different states of matter located in the atmosphere and the heavenly region. Note, again, that showing contrary properties is not particular to ψυχή. The mass of earth also covers a wide range of states that can manifest opposite physical properties from the dry, soft, bright and barren sand through the moist, dense, dark and fertile soil to dry and hard rocks. Different forms of water also show contrary absolute and relational properties; just to mention one, salty seawater is lethal for human beings, but the fresh water of springs is healthy.

Incidentally, these considerations should remind us of the fact that the terms of the transformations described in B 36 are not the elements as later philosophers in the wake of Empedocles conceived of them. Earth and water in B 36 are not elementary forms of matter with a fixed set of properties,[42] but large masses that comprise also contrary characteristics—and this applies to ψυχή as well.

The view that ψυχή encompasses a wide continuum of physical states offers considerable theoretical advantages for Heraclitus' philosophy. First of all, it is an unmistakable feature of Heraclitus' thought, that he, more than any other Presocratic, emphasizes the differences in the epistemological and moral states of people. On the one hand, his diatribe against the lamentable stupidity and wretched baseness of the many is a central element of his whole discourse. Fragments to this effect abound and there is no need to quote them here. Yet, on the other hand, Heraclitus clearly implies that this is not only what is available for humans, for people would have the possibility to improve themselves, and there are some, including of course Heraclitus himself, who have actually attained a much higher state in becoming wise and morally excellent. It remains true however that the perfection of the divine is beyond the limitations of the human condition.

Now, as we have seen, the soul is the center of cognition and ethical behavior. Moreover, we have also seen that the moral and intellectual properties of the soul are correlative to its physical properties, in particular whether it is wet or dry. Maintaining that the ψυχή can manifest opposite intellectual and moral properties and maintaining at the same time that these intellectual and moral properties are correlative to the relevant physical properties, entail that the soul stuff must be such that it can manifest opposite physical properties. The soul can be foolish and wise, virtuous and wretched, because it can be both dry and wet. So it is not the case that part of the soul dies when one debases oneself by being stupid, drinking too much, or being wicked, as the identification of ψυχή with fire would require. The soul in becoming wet clearly approaches death, being on the way to water, but has not as yet died. Nor is it the case that the soul becomes something else, a different stuff, not-soul, when it reaches an excellent, divine state, as the identification of ψυχή with air would require.[43] The most fiery, and hence best state of the soul is reserved for the cosmic fire, and for the fire burning in the heavenly bowls. But these forms of fiery ψυχή show the same type of mental, intellectual, ethical properties as the more airy human ψυχή does—only on a much higher level. This connection was clearly seen by Galen when he writes:

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[42] So also KRS 204, n. 1.

> For those who hold that the soul is the form of the body will be capable to maintain that it is not dryness, but the equality of mixture, that makes it more intelligent; in this they differ from those who hold that as much as the mixture becomes dryer, so much will also the soul become more intelligent. But should we not agree with Heraclitus' followers that dryness is the cause of intelligence? For also he himself said: "A gleam of light (αὐγή): dry soul, the wisest,"[44] again esteeming that dryness is the cause of intelligence. Indeed, one must hold this superior doctrine, considering the fact that the stars, which are luminous (αὐγοειδεῖς) and dry, possess the highest form of intelligence. (Galen, *Quod Animi Mores Corporis Temperatura Sequantur* 4.786 Kühn; following Müller's Teubner text, I omit the words τὸ γὰρ τῆς αὐγῆς ὄνομα τοῦτ' ἐνδείκνυται marked.)

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[43] So I cannot agree with Kahn *H.* 251 when he says that "What he [sc. Heraclitus] probably meant, therefore, but what would be difficult to say (since *psychê* means 'life') is that the passage of the *psychê* into celestial fire might be both the death of *psychê* and at the same time its attainment of the highest form of life."

[44] Galen omits the last word of the fragment (καὶ ἀρίστη) presumably because he concentrates on the cognitive capacities stemming from dryness.

IV

There is only one question from our list that has not as yet received an answer: (Q2) *How can we conceive the shift from soul to souls?* The gist of the answer, I would maintain, may come from a doxographical report by Sextus. The first part of the most elaborate ancient discussion of Heraclitus' psychology in *M.* 7.127–30 runs as follows:

> (127) But what this [Heraclitus' common and divine reason] is must be explained concisely. It is a favourite tenet of our Physicist that that which surrounds us is rational and intelligent. (128) [Sextus lists poets who assumedly held the same doctrine before Heraclitus] (129) According to Heraclitus it is by drawing in this divine reason (λόγον) in respiration that we become endowed with mind (νοεροὶ γινόμεθα), and in sleep we become forgetful, but in waking we regain our senses. For in sleep the passages of perception are shut, and hence the mind (νοῦς) in us is separated from its natural unity with the surrounding medium; the only thing preserved is the connection through breathing, which is like a root. So when separated, our mind loses its former power of memory. (130) But when we awake it goes out again through the passages of perception as through so many windows, and by contact with the surrounding medium it regains its rational power. Just as coals that are brought near the fire undergo a change and are made incandescent, but die out when they are separated from it, just so does the portion of the surrounding medium which resides as a stranger in our bodies become nearly irrational (ἄλογος) as a result of separation, but by the natural union through the multitude of passages it attains a condition which is like in kind to the whole. (trans. based on Polito and Kahn)

It has usually been maintained that this testimony contains practically nothing that we could attribute to Heraclitus. Kahn *H.* 293–6 discusses the text in an Appendix and concludes that the heavily Stoicizing interpretation preserved by Sextus is "without any authority for the modern interpretation of Heraclitus" (p. 269). In the most recent extensive treatment of this passage, Roberto Polito,[45] on the other hand, lists powerful arguments, some of which go back to Diels, against the idea that the Heraclitus doxography in Sextus is of Stoic origin. Admitting that the idea of a cosmic Reason (*logos*) is indeed Stoic, he points out that there is no reason why a Stoic would interpret this cosmic Reason to be air or attribute such an idea to Heraclitus. Moreover, it is not a Stoic idea that we partake in the rational principle by breathing in the atmospheric air that surrounds us. Finally, the view that in sleep we are separated from Reason and our minds are inactive is un-Stoic, and indeed there is evidence that the Stoics had a different interpretation of the state of sleep in Heraclitus.[46] Polito then argues forcefully that the source of Sextus is Aenesidemus' interpretation of Heraclitus. Polito seeks to explain the admittedly Stoic elements in the text (such as divine Reason) by suggesting that Aenesidemus himself was working not on Heraclitus' book, but on an authoritative, systematic, word-by-word commentary on Heraclitus, for which he thinks Cleanthes' exegesis of Heraclitus is the most plausible candidate.[47]

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[45] Polito (above, n. 22) 149–172.

Now what is it that we can still attribute to Heraclitus from this account? In particular, how shall we assess the role assigned to breathing? Is there anything Heraclitean in it? Although Polito provides a detailed analysis of the Hellenistic medical pedigree of the breathed-in-soul doctrine, and the reasons why Aenesidemus espoused it, he tentatively leaves open the possibility that it was present in Heraclitus as well. He, however, points out that it is somewhat problematic to square this with the idea that soul for Heraclitus is fire or fiery.[48] But this is not any longer a problem when we accept that everything from the lowest part of atmosphere to the heavenly fire counts as soul for Heraclitus. And we can know from Diogenes of Apollonia B 4 and Aristotle that there were pre-Hellenistic versions of the idea of a breathed-in-soul.[49] The doctrine of breathed-insoul, together with the idea that different layers of exhalation show different levels of intellectual powers in connection with the differences in the relevant physical properties, can explain the description of sleep in Sextus as well. Because in sleep we are only in connection with the lowest layers of air through breathing, our souls are only nourished by the least intelligent part of external soul stuff. It is sufficient to keep us alive, and to maintain our souls in a stand-by position, as it were. Note also that when the text says that through breathing we become νοεροί, it cannot mean that we become intelligent in the strong sense of the word. As the rest of the passage makes it clear, to become intelligent it is not enough to keep breathing. I thus agree with Polito (above, n. 22) 153 that the expression must mean something like "breathing supplies us with psychic matter" or endowed with mind; in other words breathing is a necessary but not a sufficient condition for becoming intelligent. This may, by the way, apply also to Cleanthes' testimony preserved by Arius Didymus fr. 39.2 Diels = Her. B 12, according to which αἱ ψυχαὶ ἀναθυμιώμεναι νοεραὶ ἀεὶ γίνονται. The meaning cannot be that the souls continuously (ἀεί) become intelligent. It is the prerogative only of some people to become truly intelligent, and breathing will clearly not suffice to attain that state. For a more intelligent functioning of the soul we need to be in contact through the senses with what surrounds us and what is permeated and physically transformed by the sun in daylight. It is only through perception, and primarily through sight, that we become in contact with the bright and the fiery.[50]

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[46] Calcidius, *Comm. in Plat. Tim.* ch. 251, p. 260 W.

[47] Polito (above, n. 22) 167.

[48] Ibid. 146–148.

[49] Arist. *De An.* 1.5 411a17–21. The doctrine is attributed specifically to the Orphic writings in 410b27–30.

The same passage in Sextus also tells us that the soul or mind in us is "separated from its natural unity with the surrounding medium" and that it is a "portion of the surrounding medium which resides as a stranger in our bodies." This, I think, provides us an answer to the remaining question (Q2) *How can we conceive the shift from soul to souls?* The move from the singular soul to the plural souls occurs when part of the continuous but layered soul surrounding us and extending to the sky gets drawn in and trapped in our bodies through breathing. Moreover, the passage in Sextus also implies that this process can be conceived as a partial dying of the soul. This interpretation, as Aryeh Finkelberg shows, is confirmed by a passage in *PH* 3.230 where Sextus explicitly attributes to Heraclitus the view that "our souls are dead and buried in us." Philo who, as we have seen above, is one of those ancient interpreters who thought that the Heraclitean soul is airy, attributes a very similar view to Heraclitus. Philo in his interpretation of Heraclitus' B 62 says that, according to Heraclitus "when we live the soul is dead and buried in the body as a tomb" (*Leg. Alleg.* 1.108.2–5).[51] According to this interpretation, then, the shift from the common, universal, singular soul to the particular, individual, private souls is already part of the way down and is characterized by dying. It seems to me that even if the wording and some details of Sextus' testimony in *M.* 7.127–30 show the traces of Stoic and Aenesidemean interpretation, the basic idea and the general thrust are entirely congenial to Heraclitus and are perfectly compatible with what I have tried to reconstruct from other sources.

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[50] The exceedingly enigmatic B 26 may support such an interpretation. Note also the use of σβέννυνται, central to B 26, in Sextus' text.

[51] Finkelberg in this volume argues that the famous *sôma-sêma* doctrine in Plato's Gorgias 492d-493a is also Heraclitean.

V

Let me wrap up now with some methodological and terminological considerations on the question whether or not, and if so with what qualifications, we can use technical terms coming from contemporary philosophy of mind in our interpretation of the Presocratics in general and of Heraclitus in particular.

Although everyone seems to agree that the Presocratics thought that the bearer (or bearers) of mental functions are bodies of some sort that have physical properties, it has sometimes been questioned whether it is appropriate to describe the Presocratics, and Heraclitus in particular, as materialists or physicalists.[52] Some commentators have maintained that it is not quite legitimate to apply these terms because the view that the bearers of mental functions are bodies showing physical properties remained uncontested all through the period. On this view, the dualist, i. e. Platonist, alternative has to be already on the table so that physicalism may emerge as an option consciously chosen and vindicated against a rival theoretical position.[53] I would certainly agree that the formulation of the dualist position had an important role in the theoretical elaboration of the physicalist position, but I do not think that the presence of dualism as a theoretically elaborated alternative is necessary for characterizing a view as physicalist. If that were the case, one could just as well claim that it is illegitimate to label ancient ethical theories eudaimonist, because the eudaimonist assumptions remained uncontested and there was no theoretically elaborated alternative on offer. Moreover, the appearance of the Platonic position in itself shows that dualism was an available conceptual possibility, and when Plato formulates his dualism, he formulates it in opposition to the philosophical views of his predecessors and contemporaries. All in all, I would stick to the idea that, quite simply, a conception or theory can legitimately be called physicalist if it satisfies our definition of physicalism. So the question is whether or not the views we can assign to the Presocratics, such as that the bearer of mental functions is a physical entity, satisfy our favoured definition of physicalism.

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[52] I use the somewhat awkward formulation 'bearer (or bearers) of mental functions' because different Presocratics use different words (such as ψυχή, νοῦς, νόησις, and φρήν) to describe this entity, and may distribute different psychic and cognitive functions among more than one of these. Materialism and physicalism is sometimes used interchangeably. For some authors, materialism is the broader term because it applies also to some pre-theoretical views (see below). Physicalism, by contrast, is broader in the sense that it accommodates forces etc. which are physical but not necessarily material.

[53] Cf. J. Barnes, *The Presocratic Philosophers* (London 1982) 475; and Gill (above, n. 3) 170.

Another, connected, worry has been that only a sufficiently explicit, theoretically elaborated position can appropriately be described as physicalist, while the pronouncements of the Presocratics had not as yet reached that level of explicitness and theoretical elaboration. As to the first component of this objection, I would agree with Terence E. Horgan, who in his entry on "physicalism" in Blackwell's *Companion to the Philosophy of Mind* has emphasized the importance of distinguishing between "(i) certain vague, partially inchoate, pre-theoretic ideas and beliefs about the matter at hand; and (ii) certain more precise, more explicit, doctrines or theses that are taken to articulate or explicate those pre-theoretic ideas and beliefs."[54] In making this distinction Horgan does not question that (i) can be called physicalist or materialist.[55] So even if the views of the Presocratics, and especially what is available to us from them, are certainly lacking in explicitness and theoretical elaboration, I do not think that anyone can deny that they satisfy at least (i).

Things get of course immensely more complicated once we try to be more specific, because, first, there is no non-contested general definition of physicalism and, second, on any account, the term covers a bewilderingly great variety of different theories and conceptions. It is thus desirable to specify, first, what we mean by physicalism in the case of the Presocratics in general and, second, more important, how to characterize the individual Presocratic texts in this respect.

Let me now try to specify what I take to be the most important difference between Presocratic and modern theories. The question that dominates modern discussions in philosophy of mind is whether or not, and if so how, mental functions and phenomena are related to anatomically recognized parts and physical constituents of our bodies. The ancient texts I have referred to approach this question from a different angle. They start from the assumption that there is a stuff in the world that is responsible for mental functions and life, and that we show mental functions and live because this stuff, along with other stuffs, is present in us.[56] The ancient authors then formulate alternative hypotheses about what this stuff is and how it works in human beings and in the world at large. Some authors, e.g., Diogenes of Apollonia and probably Anaximenes, identify this stuff with an elemental mass, whereas other authors such as Anaxagoras and the Socrates of the *Memorabilia* and *Philebus*, treat mind and soul as stuffs apart. A connected point of contention is whether or not the stuff responsible for vital and mental functions participates in the transformations among different stuffs. Diogenes of Apollonia and Anaximenes think that it does, whereas Anaxagoras, Socrates and Plato's Timaeus hold that it is insulated from transformations among other stuffs. The central question of the ancients is not how a physical stuff can under certain conditions show also mental properties, but rather they take it for granted that there is such a stuff, material or otherwise, and that it inheres in us as well.

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[54] T. Horgan, "Physicalism," in S. Guttenplan (ed.), *A Companion to Philosophy of Mind*, (London 1994) 471.

[55] With an avowedly arbitrary terminological decision, Horgan then reserves "materialism" for (i) and uses "physicalism" for (ii).

Heraclitus, more specifically, has repeatedly been called an identity theorist.[57] As must have been clear from what I have said above, I also agree that, for Heraclitus, one's moral and intellectual condition is identical with the physical state of one's soul. But due caution, and some qualification, are in order here as well. Modern type-identity theorists are generally interested in the relationship between the mental properties of intentional states and sensations, such as having a certain thought or having a certain sensation, and the corresponding bodily states. Heraclitus, in contrast, seems to be much more concerned with more or less standing conditions or dispositions such as being wise, being morally excellent and so forth, which can be expressed on the dry-wet axis. He certainly treated drunkenness in this context, but I wonder if he went any further and analyzed particular mental states, such as having a particular thought, desire or sensation in terms of the physical properties of the soul. It may be significant in this respect that Theophrastus has practically nothing to say about Heraclitus in his extensive discussion of Presocratic theories of perception.[58]

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[56] As Tim Crane has reminded me, the closest modern analogy may be Henri Bergson's vitalism.

[57] So, e.g., G. S. Kirk, "Heraclitus and death in battle," *AJP* 70 (1949) 392, followed by Kahn *H.* 249, quoted also by Schofield (above, n. 2) 15.

Appendix 1

On the life and death of the soul and the elements

I have argued above that the formulation of B 36 is out of the ordinary not only because it apparently ascribes life and death to various material stuffs, but also because it attributes life and death to the ψυχή. Usually, it is the human being (or other kinds of organisms) who lives and dies, and death means, according to the standard archaic conception, that the soul departs from the body. In the rare occurrences where the ψυχή is said to be destroyed, the word quite clearly stands for the whole person in a synecdoche, or more probably to the life of the person, as e.g. in Aeschylus' *Agamemnon.* (Aesch. *Ag.* 1465–6 speaking about Helen: ὡς μία πολλῶν | ἀνδρῶν ψυχὰς Δαναῶν ὀλέσασ’). But even in such cases, ψυχή is said to be destroyed and not to die. The intended meaning, even if taken literally, is then that the life force of many people got destroyed and hence many people died. Apart from Heraclitus, the earliest text in which the ψυχή is said to die is Sophocles' *Antigone* 559–60: σὺ μὲν ζῇς, ἡ δ’ ἐμὴ ψυχὴ πάλαι | τέθνηκεν seems to stand for the human being, as has been well explained by Nussbaum.[59] To what Nussbaum and others said about dying, we might add the other side. γενέσθαι, 'becoming' or 'being born," if possible, is even less easily applicable to the ψυχή. To my knowledge, no early text speaks about the birth of the soul and, indeed, it is difficult to imagine in what context this idea could occur. And again, the relationship between ψυχή and *life* is just as problematic as the ones between ψυχή and death and ψυχή and birth: it is the human being, and not the ψυχή, who lives by virtue of ψυχή. The only pre-fifth century text in which the ψυχή might be said to live is Pi. *P.* 3.61–2 μή, φίλα ψυχά, βίον ἀθάνατον | σπεῦδε. But here again, it is unclear whether the ψυχή strives after a deathless life for itself or, which seems the more probable option, for the human being to whom it belongs.

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[58] The point about Theophrastus has been made by Laks (above, n. 17) 254. Theophrastus' only claim, i.e., that Heraclitus, together with Anaxagoras, thinks perception to be by contraries, seems to be a possibly unwarranted inference from the role of opposites in Heraclitus.

[59] Nussbaum (above, n.2) 153–4.

Pindar's verse brings us in turn to the adjective ἀθάνατος applied to ψυχή. The earliest text in which the soul is said to be ἀθάνατος is the famous passage in Herodotus where he describes the Egyptian and Pythagorean doctrine of reincarnation (2.123). When applied to the ψυχή, it is not immediately obvious what the opposite of ἀθάνατος is, exactly because of the problematic relationship between ψυχή and death as discussed above. It seems that in this early context the opposite of an ἀθάνατος ψυχή is not merely, and not even primarily a ψυχή which dies. Rather, it is opposed to a ψυχή which, as in Homeric eschatology, continues to exist after the death of the individual, but goes to Hades and stays there indefinitely, and therefore ceases to be the soul of a living being. A ψυχή might then be qualified ἀθάνατος in so far as it continues to be present in, and bring life to, (different) living organisms.

This body of evidence, both positive and negative, strongly suggests that in speaking about the ψυχή, death and life are not simple opposites, and are not simply equivalent with the existence or non-existence of the ψυχή. Similarly, ascribing death or destruction to the ψυχή, on the one hand, and claiming it to be ἀθάνατος, on the other, are not simple opposites and do not create a complete disjunction. This is so precisely because in the traditional, Homeric, conception the ψυχή continues to exist, without however bringing life to a living organism.

B 36 appears thus to redefine the scope of application of the terms 'death' and 'birth,' by applying them to the ψυχή and the elements. If so, B 36 can provide a coherent interpretative context for B 62:

> ἀθάνατοι θνητοί, θνητοὶ ἀθάνατοι,
> ζῶντες τὸν ἐκείνων θάνατον,
> τὸν δὲ ἐκείνων βίον τεθνεῶτες.
>
> Immortal mortals, mortal immortals,
> living the death of these,
> and dying the life of these.

This fragment is often praised for its perfect composition, and, at the same time is often called one of the most enigmatic of Heraclitus' sayings.[60] Without intending to dissipate all its magnificent obscurity, let me say that the fragment can be mapped seamlessly on the subjects of B 36. In view of Heraclitus' general physical theory, the elements can be called immortal, in so far as there is no moment in the history of the world in which any of these completely and definitively[61] ceases to exist.[62] On the other hand, B 36 explains in which sense they are subject to death, and also in which sense one comes to life from the death of the other. If so, the fragment, at least at one level of interpretation, is not giving a redefinition of gods and humans and the relationship between the two groups, but rather redraws the possible sphere of application of the terms 'immortal' and 'mortal,' in close connection to the redefinition of the sphere of application of the terms 'coming to life' and 'dying' that we have seen in B 36.

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[60] Cf. e.g. Marcovich *H.* ad loc. 240: "The meaning of the saying is obscure." Schofield (above, n. 2) 32: 'Clearly it is a riddle which can be solved only by the reader who has thought his or her way through the whole Heraclitean *logos* already.' B 62 has received a thorough re-examination by B. Bossi, "Acer-

An immediate additional confirmation for this line of interpretation comes from the last part of B 30:

> πῦρ ἀείζωον, ἁπτόμενον μέτρα καὶ ἀποσβεννύμενον μέτρα.
>
> Ever-living fire, kindling in measures and quenching in measures.

The adjective ἀείζωον not only ascribes life to fire, but functions as a synonym for ἀθάνατος. The last two clauses, by contrast, can be taken as functional synonyms of 'coming to life' and 'dying.' On the basis of these considerations, I think Maximus Tyrius is basically correct in connecting B 62 with the road up and down of B 60, and in merging it with the elemental cycle of B 36, to come up with the following free paraphrase[63]:

> μεταβολὴν ὁρᾷς σωμάτων καὶ γενέσεως, ἀλλαγὴν ὁδῶν ἄνω καὶ κάτω, κατὰ τὸν Ἡράκλειτον· καὶ αὖθις αὖ ζῶντας μὲν τὸν ἐκείνων βίον, ἀποθνήσκοντας δὲ τὴν ἐκείνων ζωήν. ζῇ πῦρ τὸν γῆς θάνατον, καὶ ἀὴρ ζῇ τὸν πυρὸς θάνα-

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ca del significado del Fragmento B 62 (D.-K.) de Heráclito," in E. Hülsz (ed.), *Nuevos Ensayos sobre Heráclito* (Mexico 2009) 285–314.

[61] Note that the view thus remains compatible with attributing the theory of *ekpyrosis* to Heraclitus. The elements may go out of existence for a while, but come back again in the next cosmic cycle.

[62] Bossi (above, n. 60) lists this reading as one of the four main interpretative options, but does not discuss it. See also M. A. Santamaría Álvarez, "La transmigración del alma de Ferecides de Siros a Píndaro," in A. Bernabé et al. (eds.), *Reencarnación: la transmigración de las almas entre Oriente y Occidente idente* (Madrid 2011) 246–8.

[63] Thus I agree with those, like Kahn *H.* ad loc., who treats Maximus' text as not being *verbatim*. On why I think that the part of Maximus' speaking about the death of fire is mistaken, see below.

> τον· ὕδωρ ζῇ τὸν ἀέρος θάνατον, γῆ τὸν ὕδατος. διαδοχὴν ὁρᾷς βίου καὶ μεταβολὴν σωμάτων, καινουργίαν τοῦ ὅλου.
>
> What you see is the transformation of bodies and becomings, the exchange of the roads up and down, according to Heraclitus; and those that again and again are living the life of these, and die the life of these. Fire lives the death of earth, and air lives the death of fire; water lives the death of air, and earth that of water. What you see is the taking over of life and the transformation of bodies, the renewal of the whole (41.4.i-k).

Understanding B 47 as speaking about the terms of the cosmic processes is a distinctly uncomplicated interpretation as compared to the ones that understand it as speaking about gods and humans. Yet it is not simplistic, because, as I have argued, it involves a radical reinterpretation of the possible references of 'immortal' and 'mortal,' 'life' and 'death,' closely connected to what we have seen in B 36 and 20. In this sense, Heraclitus appears to be an important antecedent for the way Empedocles speaks of the elements as immortal mortals for example in B 26:

> …in this respect they come to be and have no constant life, but insofar as they never cease from constantly interchanging, in this respect they are always unchanged in a cycle. (Trans. Inwood)

And in the same context, we could also mention Aristotle's *GC* 2.10 in which the elements come-to-be and pass-away to approximate an eternal life through their continuous cyclical transformations.

I should like to stress that the fact that B 47 can receive a satisfactory and coherent interpretation when connected to B 36 and 20 does in no way mean that it cannot have further levels of signification. We are, after all, speaking about a Heraclitean fragment.

Appendix 2

Anaximenes and Heraclitus on the soul

There is one important fragment from the period before Heraclitus that appears immediately relevant to the physical aspect of Heraclitus' theory of ψυχή. This is Anaximenes B 2:

> οἷον ἥ ψυχή … ἥ ἡμετέρα ἀὴρ οὖσα συγκρατεῖ ἡμᾶς, καὶ ὅλον τὸν κόσμον πνεῦμα καὶ ἀὴρ περιέχει.
>
> Just as the ψυχή, which being our air, keeps us together, so do the breath and air encompass the whole world.

The authenticity and interpretation of this fragment is hotly debated. The text, preserved by Aëtius in his inventory of ἀρχαί, has no parallel, and no other source tells us anything on Anaximenes' views on the soul apart from a remark by Philoponus. In commenting on Aristotle's contention in *De Anima* 1.2 405a21–2 that Diogenes 'and some others' (καὶ ἑτεροί τινες) took air to be the ἀρχή and the soul, Anaximenes, says Philoponus, is a good candidate for being one of the unnamed others. Admittedly, this is not very compelling. Indeed, numerous interpreters have doubted whether Anaximenes said anything at all about the soul.[64] Moreover, almost all agree that the wording cannot be original, mainly on account of the use of the terms συγκρατεῖ and κόσμον. Because of these reasons, many have claimed that the text preserved by Aëtius has nothing to do with Anaximenes. Earlier, Reinhardt and others had maintained that the view expressed in B 2 is sheer Stoicism.[65] Karin Alt, who has offered the most detailed historical analysis of the fragment, has successfully disproved this thesis. Ultimately, however, she also thinks that the attribution to Anaximenes is unfounded and suggests, not very convincingly to my mind, that it is merely the result of confusing Anaximenes with Diogenes of Apollonia.[66] All in all, I still find Vlastos' formulation the most judicious: "though much of the wording of this fragment is doubtful, there is no good reason to doubt that it paraphrases an analogy by Anaximenes himself"; Vlastos (1993) 147.[67]

The basic purport of the fragment is relatively clear and uncontested. It states (1) that the ψυχή in us is a stuff that exists also in the world at large, and (2) that this stuff is responsible for both psychic and cosmic functions. This much is already sufficient to establish an important connection between Anaximenes and Heraclitus; all the more so as Anaximenes' seems to be the earliest formulation of this idea. It is fair to assume, moreover, and as far as I am aware no one denies it, that Heraclitus knew Anaximenes' doctrines. If so, it is a reasonable conjecture that Heraclitus' own views are to some extent dependent on, and contain a critical reaction to, Anaximenes' theory.

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[64] G. Wöhrle, *Anaximenes aus Milet* (Stuttgart 1993) 15: 'Ob sich also Anaximenes tatsächlich über die Seele in irgendeiner Weise geäußert hat, läßt sich kaum mit Sicherheit sagen.'

[65] K. Reinhardt, *Kosmos und Sympathie* (Munich 1926) 213, followed by, among others, J. Kerschensteiner, *Kosmos* (Munich 1962) 83.

[66] Alt (above, n. 17) 157–64.

[67] Vlastos in the same paper also emphasizes the importance of Anaximenes B 2 for the understanding of Heraclitus, although I derive different conclusions from this evidence.

Let us see then in what way Heraclitus reacted to Anaximenes in formulating his own views on the soul, starting with the general characteristics of the two doctrines and their place in the respective physical theories they form part of. First a point of contact: in accordance with the general tendencies of Ionian physics, both Anaximenes and Heraclitus allowed that different forms of matter turn into each other. But then comes the contrast in the description of the transformation: condensation and rarefaction for Anaximenes, cooling and warming, moistening and parching for Heraclitus (cf. B 126).

The second point of comparison concerns the role of the soul in both human beings and the cosmos at large. Here things become tricky, especially regarding Anaximenes. This is so because there are good reasons to think that the word συγκρατεῖ that describes the function of the air in human beings, is not Anaximenean.[68] If it still carries over something of the sense of the original, it seems that the function ascribed to air in both roles is something like 'holding together.'[69] With respect to Anaximenes, anything further is a matter of conjecture. Thus, one may think that the air also *governs* or *steers* both the cosmos and the human being.[70] Yet it is an open question whether συγκρατεῖ, or whatever stood in its place in Anaximenes' original, had anything to do with governing or steering. It seems to me just as possible that, closer to the Homeric meaning of the word ψυχή, what the air does is keeping the cosmos together and *keeping it functioning*. The fact that πνεῦμα is emphasized on the cosmic side may support this interpretation in so far as blast or wind is the active manifestation of air. As long as the air is there and remains active, the human being and the cosmos remain functional and do not decompose.

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[68] As many have pointed out this verb is suspicious because it is only attested much later, first in Plutarch, and even then rather rarely. It is unclear what may have stood in its place in Anaximenes' text. But it is just as unclear to me why one found this word appropriate to inflict on Anaximenes and thus create a less than obvious analogy with περιέχει.

[69] The best attested meaning of συγκρατέω is 'to keep something together by authority or force' (as a general keeps together his troops in Plut. *Phoc.* 12), so when one tries to find a common denominator between συγκρατέω and περιέχει, the best bet I think is still that the air holds together and keeps in a functional state both the world and the human beings. The cosmos would fall apart and stop functioning without the encompassing air, just as the human being disintegrates and stops functioning when the soul leaves it. Holding the living being together is a distinct function of the soul also in Aristotle's discussion towards the very end of *De Anima* 1 at 411b7–9.

[70] See the different possibilities lined out in KRS 160.

Some interpreters went further and claimed that Anaximenes' air must also be intelligent. Interestingly, this claim is based not on the function of air in human beings, but on the assumption that the air also governs Anaximenes' cosmos.[71] This, however, seems to me a rather bold interpretative leap, for the text does not even say in so many words that the air governs the cosmos—it only says that it encompasses it. This stronger interpretation, I suggest, reads back to Anaximenes a move that was made by Heraclitus in reaction to Anaximenes. What makes this move possible is precisely the novelty of Heraclitus' conception of ψυχή, which consists in making the ψυχή the center of both motor and cognitive functions.[72]

So Heraclitus' critical assessment of Anaximenes' position on the soul thus far would be something like this. Anaximenes was correct in conceiving the soul as a portion of some stuff, which also has cosmic functions and which can turn into other stuffs. But he is not quite right in describing the role of this stuff in both the cosmos and the individual human being. For the main function of the ψυχή in both contexts is cognition and intelligence, and closely related to it, control. It does not merely hold things together, but determines the behavior of both the cosmos and individual human beings.

Now what about the physical identification of the soul? On the interpretation I suggest, Heraclitus' critical attitude towards Anaximenes turns out to be more complex than either simple refusal or agreement. He can agree with Anaximenes in saying that the soul, in the large majority of people, is atmospheric air. He can nevertheless point out that Anaximenes is hubristically overoptimistic when he considers that that form of matter which in most human beings functions as soul is the most important, nay, divine form of matter that fullfils the central cosmic functions as well. It is sheer hubris to identify the souls in these people with the highest state of soul stuff. These souls, though parcels of the same cosmic mass, are qualitatively different from the highest form of soul—they are wet, approaching water, whereas soul in its ideal state is dry and fiery.

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[71] So e.g. Laks (above, n. 17) 252: 'and air was probably also responsible for what we call thought, since it governs Anaximenes' universe."

[72] On this, see above pp. 225–6.

Appendix 3

Heraclitus and the Orphic writings on the soul

The connection between Heraclitus and Orphism is a dauntingly complex issue, with a long history in the literature, which I cannot discuss here in any detail. Let me, however, point out that the interpretation of Heraclitus I have offered above creates a connection between two otherwise unconnected Orphic fragments, and in turn receives some cumulative support from them.

Clement, our primary source for B 36, reports the fragment thus:

> Orpheus composed the following verses:
> Water is dying for the soul, for waters, earth.
> From water earth comes to be, from earth water again,
> from that soul that turns into the whole of aither.
>
> Heraclitus, who put together his account from these verses, writes something like this:
>
> For souls it is to die to become water,
> for water it is to die to become earth,
> from earth water is being born,
> from water soul.[73]

So Clement starts by quoting the verses he attributes to Orpheus (*OF* 226 = 437 F Bern.) that show an uncanny resemblance to B 36.[74] Then he claims that Heraclitus in composing B 36 was inspired by, or simply plagiarized, Orpheus. In all probability, Clement here reverses the direction of influence, and the author of the Orphic verses was drawing on Heraclitus.[75]

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[73] Clem. *Strom.* 6.2.17 Ὀρφέως δὲ ποιήσαντος·
ἔστιν ὕδωρ ψυχῇ, θάνατος δ’ ὑδάτεσ<σ>ιν ἀμοιβή,
ἐκ δὲ ὕδατος <μὲν> γαῖα, τὸ δ’ ἐκ γαίας πάλιν ὕδωρ·
ἐκ τοῦ δὴ ψυχὴ ὅλον αἰθέρα ἀλλάσσουσα
Ἡράκλειτος ἐκ τούτων συνιστάμενος τοὺς λόγους ὧδέ πως γράφει· “ψυχῇσιν θάνατος ὕδωρ γενέσθαι, ὕδατι δὲ θάνατος γῆν γενέσθαι, ἐκ γῆς δὲ ὕδωρ γίνεται, ἐξ ὕδατος δὲ ψυχή.”

[74] *OF* 226 = 437 Bern. has recently been re-examined by M. Kahle, “*OF* 437 and the transformation of the soul,” in M. Herrero et al. (eds.), *Tracing Orpheus* (Berlin 2011) 153–158.

[75] See, in this sense, A. Bernabé, A. *Textos órficos y filosofía presocrática: materials para una comparacíon* (Madrid 2004) 61–2. I am however not entirely convinced by Bernabé’s argument that the Orphic text shows Stoic influence. We don’t have

From the point of view of the reconstruction I have offered above, it is noteworthy that the Orphic formulation does not retain the distinction between the singulars and the plural of the Heraclitean original. On the other hand, it makes explicit that in the step described in the final verse, ψυχή joins the cosmological element that constitutes the heavenly region. What, however, makes the Orphic recycling of Heraclitus' B 36 particularly significant for my purposes is its possible connection with another set of Orphic fragments about the soul. One of the earliest evidence about Orphic conceptions of the soul comes from Aristotle's *De An.* 1.5 410b27–411a1 (*OF* 27 = 421 F Bern.[76]):

> This is what applies also to the account contained in the so-called Orphic poems. For it claims that the soul, carried by the winds, enters from the universe as we breathe. This is not possible to happen in the case of plants, nor of certain animals, given that not all of them breathe.

The view expressed here contains the gist of the doctrine Sextus attributes to Heraclitus, i.e. that the soul enters the body by breathing in the atmospheric air. Indeed, Iamblichus' interpretation of Aristotle's reference comes even closer to my proposed reading of Heraclitus:

> ἔοικέ γε μὴν αὐτὸς ὁ Ὀρφεὺς χωρὶς ὑπολαμβάνειν εἶναι καὶ μίαν τὴν ψυχήν, ἀφ' ἧς πολλὰς μὲν εἶναι διαιρέσεις, πολλὰς δὲ καὶ ἀμέσους ἐπιπνοίας καθήκειν ἐπὶ τὰς μεριστὰς ψυχὰς ἀπὸ τῆς ὅλης ψυχῆς.
>
> At least it seems that Orpheus himself supposes that the soul is separate and unique from which there are many portions, and many and immediate inhalations reach these individual portions from the universal soul (Iamblichus *de An.* ap. Stob. 1.49.32.104–108)

The fragment preserved by Vettius Valens (317.19 Pingree = *OF* 228b = 422 F Bern.), moreover, shows that the Aristotelian evidence is not isolated: ἀέρα δ' ἕλκοντες ψυχὴν θείαν δρεπόμεθα, "When we draw in the air, we pluck for ourselves the divine soul." From the point of view of our present concern, it is particularly significant that the Aristo-

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the standard Stoic list of the four elements (as in some versions of B 36), and, despite the evidence of Arius Didymus fr. 39 = *SVF* 2.821, the mention of the αἰθήρ is not conspicuously Stoic either.

[76] For a recent discussion of this text, see C. Megino, "Aristóteles y el Liceo ante el orfismo," in A. Bernabé & F. Casadesús (eds.), *Orfeo y la tradicion órfica* (Madrid 2008) 1281–1306; and id. "Presence in Stoicism of an Orphic doctrine on the soul quoted by Aristotle (*De Anima* 410b 27 = *OF* 421)," in M. Herrero de Jáuregui et al. (eds.), *Tracing Orpheus* (Berlin 2011) 139–146.

telian evidence ensures that the author of the Orphic writing in question adopted this view independently of any Stoic influence.

There is of course no guarantee that the Orphic rephrasing of B 36 and the Orphic doctrine reported by Aristotle ever formed parts of a coherent and explicit "Orphic theory of the soul."[77] Yet I find it remarkable that they correspond perfectly to the respective parts of the Heraclitean theory as I have tried to reconstruct it. Naturally, one can come up with different scenarios to explain this body of evidence. For instance, one could speculate that first some Orphics espoused the doctrine of the breathed-in soul from whatever, non-Heraclitean, source, then the Stoics mistakenly attributed the same view to Heraclitus, and then some later Orphics accepted this Stoicizing (mis-)interpretation of Heraclitus, and this in turn gave them the motivation to adapt Heraclitus' B 36. Yet, I find it just as conceivable that we don't need to presuppose such zigzags, and hypothesize that some relatively early Orphics were impressed directly by the Heraclitean theory of the soul, both that the ψυχή can be identified with the element that extends from the atmospheric air to the heavenly fire *and* that we receive shares of it by breathing it in.

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[77] Interestingly, recent treatments of the relevant Orphic fragments in Megino (2011, above, n. 77) and Kahle (above, n. 75) do not make the connection.

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9. How Not to Conceive Heraclitean Harmony

Roman Dilcher

Harmony is presumably one of the terms that is most often connected with Heraclitus' philosophy, as it were, almost like a title that indicates the character of his thought as a whole. But the difficulty with the Heraclitean concept of harmony is that it is hard to tell what its difficulties are. From a semantic point of view, ἁρμονία denotes something that is joined together, a connection or a fitting. In this way, harmony can be, and usually has been, taken to express the structural side of what Heraclitus calls more concretely κόσμος: the order of the world that is established by fire and its measures. Thus, harmony may be seen as a more concrete explanation of how everything happens according to *logos* (κατὰ λόγον, B 1). On the other hand, the concept of harmony leads to what is often believed to be the central thesis of Heraclitus' philosophy—the so-called unity of opposites. The main text for the concept of ἁρμονία is B 51: "They do not understand how going apart with itself it accords: a back-stretched fitting, such as that of bow and lyre," οὐ ξυνιᾶσιν ὅκως διαφερόμενον ἑωυτῷ ὁμολογέει· παλίντονος ἁρμονίη ὅκωσπερ τόξου καὶ λύρης.[1]

Now, although the "unity of opposites" is an almost ubiquitous formula in contemporary interpretations, there are some fundamental problems with it which I shall address briefly and a little dogmatically:[2]

1. In Heraclitus we often find the term for unity (ἕν), but never the Greek word for opposites, ἐνάντια. This is a simple fact, and a fact that at the very least needs to be addressed by anyone believing in a "unity of opposites." B 51 provides the term that comes closest

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[1] For a discussion of the textual problems see Kirk, *H.* 203–21; Kahn, *H.* 195.

[2] For a more thorough discussion I may refer to my own book (Dilcher, *H.*), ch. V. A slightly different account why Heraclitus does not use the term opposites is given by T. Buchheim, *Die Vorsokratiker* (Munich 1994) 78 ff. From the perspective of the history of interpretations, it was Karl Reinhardt who succeeded in shifting attention away from the flux doctrine to the problem of opposites as being the central issue in Heraclitus: *Parmenides und die Geschichte der griechischen Philosophie* (Bonn 1916) 220.

to speaking of opposites: διαφερόμενον. In contradistinction to the talk of opposites, διαφερόμενον is an expression in singular form, "that which is going apart, which is differing (from itself)." To this we may without hesitation apply a predicate of unity: "it is one," but whatever this means it will still be uninformative since the subject is conceived of as a single phenomenon in the first place, and not as two opposing forms. However, what is in fact predicated of it in B 51 is ἑωυτῷ ὁμολογέει, "it accords with itself." Whichever way this is explicated, it certainly will not yield anything resembling the common interpretations of opposites; i. e., that on the surface there are, and are believed to be, two opposite phenomena (such as day and night), in which some sort of (hidden) unity can subsequently be discovered, such that from disparate appearances the philosopher's synthetic view will arrive at an underlying unity. In short, the formula of unity of or in opposites is right from the beginning in glaring contradiction with the main relevant text of Heraclitus.

2. The collection of Heraclitean fragments contains endless instances of what can formally be classified as opposites. These alleged opposites are very diverse, and accordingly the logic of their being one would perforce be almost equally diverse. Heraclitus nowhere tells us that these various instances should all be taken to be examples of one doctrine of which they are illustrations and which should be extracted from them. If one nevertheless insists on doing so, the onus of defending such a thesis will be on the interpreter, and this onus is a heavy one indeed. For either one will reach the conclusion that Heraclitus has, to say the least, overstated his case, as many examples do not match the thesis of unity once this is formulated in a logically sound way. Or else one will have a very vague notion of unity that can encompass all the diverse instances precisely by virtue of being vague and indeterminate. In addition to vagueness, this way of interpretation will produce emptiness. In illustrating this one vague theory of unity, the various fragments will tend to be degraded and become nothing more than illustrations. If their main point is just to demonstrate unity again and again, they will lose their power to say something of their own.
3. The specific interpretation of the formula *unity in opposites* that has in some way or other become predominant (Kirk here being the starting point) leads to further problems. In order to avoid the charge of contradiction (from Aristotle to J. Barnes), the unity of

> the opposites is usually said to amount not to strict identity (e. g., day *is* night), but rather to some sort of underlying unity. According to this interpretation, day and night are one in respect of something else, for instance of the continuum of time they both occupy. Honorable though this solution may be, it has the flaw of turning Heraclitus surreptitiously into a premature Aristotelian. The term "underlying" which is so frequently und unhesitatingly used in scholarship has its origin in Aristotelian physics and metaphysics, which becomes plain once it is rendered in Greek: ὑποκείμενον (from which come Latin *sub-stratum* and *sub-stantia*).[3]

In *Physics* Alpha, Aristotle develops for the very first time this notion of ὑποκείμενον by starting with the traditional (i. e., Presocratic) ways of accounting for movement through opposites and showing that some third principle underlying movement from one opposite to the other is needed. Interpreting Heraclitus along such Aristotelian lines will not only spoil Aristotle's innovative point but will also deprive Heraclitean unity of its most characteristic trait which in B 51 is expressed as a back-stretched fitting. No underlying substratum will be able to possess that tension that bow and lyre are meant to display.

As long as the formula of unity of opposites cannot be matched with Heraclitus' own conceptualization (of unity as well as of those phenomena *we* usually class as opposites), such as can be gathered from B 51, it will be a mere *phantasma* of scholarship. It may after all not be incidental that Heraclitus does not directly introduce his notion of ἁρμονίη. What he says is first of all that "they" do not understand it. So harmony seems to be a special instance of the general human tendency to incomprehension. In addition, B 54 tells us that an unapparent fitting is stronger than an apparent one (ἁρμονίη ἀφανὴς φανερῆς κρείττων). While it is not clear what bearing this distinction has on understanding the back-stretched fitting of B 51 as manifest in bow and lyre, it appears that in order to understand Heraclitean harmony we also have to pay attention to the distinction between the apparent and the unapparent. So in order to understand the harmony of B 51 the first question that needs to be addressed is why men tend to fail to comprehend it. The Heraclitean concept of harmony turns into the problem how harmony is to be properly conceived.

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[3] B 67 has sometimes been adduced as implying a Heraclitean notion of the "underlying." If Fränkel's supplement "oil" is accepted then this can indeed be interpreted as in some way "underlying" the various spices. Yet this is still a far cry from both the Aristotelian conception and from the sort of idea that is used to explain the alleged "unity of opposites." In B 67, god is presented not as a unity "underlying" a specific pair of opposites but as "being" all those that are named. The structure in question here is also special in that the differences among the various phenomenal instances are to be explained not as being *opposites* but as being different "tastes" or rather "names" of the same thing (cf. Dilcher, *H.* 124–5). Neither tastes nor names can properly be said to be opposed to one another.

There is one Heraclitean fragment that deals explicitly with the problems of cognition of what is apparent. It is one of the longest extant fragments of Heraclitus, containing no less than 37 words. And yet, although it belongs to the few texts with a more discursive structure, and though there are no problems of textual transmission,[4] it has seldom received proper attention. I am speaking of B 56, the legend of Homer and the lice riddle. It runs as follows: ἐξηπάτηνται οἱ ἄνθρωποι πρὸς τὴν γνῶσιν τῶν φανερῶν παραπλησίως Ὁμήρῳ, ὃς ἐγένετο τῶν Ἑλλήνων σοφώτερος πάντων. ἐκεῖνόν τε γὰρ παῖδες φθεῖρας κατακτείνοντες ἐξηπάτησαν εἰπόντες· ὅσα εἴδομεν καὶ ἐλάβομεν, ταῦτα ἀπολείπομεν, ὅσα δὲ οὔτε εἴδομεν οὔτ᾽ ἐλάβομεν, ταῦτα φέρομεν.

The translation provides no problems: “Men are mistaken with respect to the cognition of apparent things, in a way similar to Homer, who was wiser than all the Greeks. For he was deceived by boys killing lice who said: ‘What we have seen and caught, we leave behind; but what we have not seen and not caught, we carry with us’.” Heraclitus here refers to the legends that were told about Homer’s life, several compilations of which are transmitted in the *Vitae Homeri*.[5] The story goes that Homer, after having spent some time on Samos, went to the island of Ios. There he was approached on the beach by some boys fishing, whom he asked whether they had caught anything. Instead of admitting that they were going home empty-handed, they answered by presenting the riddle. Unable to make sense of their words, Homer is reported to have passed away.

Now, Heraclitus would hardly have included this little story just for purposes of entertainment. Indeed, presenting a riddle appears quite in line with the style of an author notoriously called the Obscure. While many fragments—and especially those that have central philosophical relevance—are in themselves enigmatic, usually consisting of condensed words with multiple meanings, the legend with the lice riddle appears rather plain. This may partly explain why this fragment has been so thoroughly neglected. Still, if Heraclitus is presenting what he has to say about cognition in the form of a riddle, or more precisely through a story containing a riddle, then we have here the same enigmatic style as a literary genre that in other fragments is displayed on the semantic level. If Heraclitus' thought as a whole presents itself as difficult to understand like an enigma or even like an oracle, then surely B 56 is supposed to provide some clue for finding a way to understanding.

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[4] Cf. Marcovich, *H.* fr. 21 (pp. 81 ff).

[5] *Homeri Opera* 5, ed. T. Allen, Oxford 1912, p. 184 ff.

This story is given as an explanation for a general human cognitive failure. Given the selective state of transmission, it could well have happened that only the first sentence would have been transmitted: "People are mistaken in respect to knowledge of apparent things." In this case, our fragment would have been a perfect example of a "general saying" (such as one often finds for instance in Stobaeus). The range and specific application of such a saying, bereft of its explanatory context, is necessarily open, and it would have been left to the interpreter to find a suitable context for it. Our fragment would then appear as just another repetition of those attacks against people's misunderstanding with which Heraclitus' discourse began. While in many instances there is simply no other choice than resorting to guesswork, B 56 offers the more or less unique opportunity to determine the specific point of the saying by referring to Heraclitus' own explanation. The Homeric legend is presented explicitly and pointedly to highlight *the specific way* in which people are mistaken.

B 56 works by comparison. People are said to ἐξηπάτηνται, to be mistaken, or more literally to be deceived or to deceive themselves. This shortcoming is to be understood not as "just as," ὥσπερ or similar, but as "nearing, being about equal to," παραπλησίως, that which happened to Homer. The legend thus provides no full parallel but just an approximation. On both sides of the comparison the verb ἐξαπατᾶν is used, so that what can be understood about Homer's situation is to be transferred to that of men in general. The point of comparison is Homer's inability to solve the riddle which, in Heraclitus' view, comes close to the general human lack of understanding. Although ἀπατᾶν is usually translated as "deceiving" (this meaning here even strengthened by the prefix ἐξ-), this will not adequately describe Homer's state of mind. He is in fact not deceived by the boys into believing something that is untrue, but is rather put into puzzlement. Instead of a straightforward answer such as: "No, we had no luck with fishing, we have just spent our time getting rid of lice," the boys utter their enigmatic words. In giving this answer, they count on Homer's preconceptions about what to expect from a fishing trip, and thereby succeed in outwitting him. Delusion may be a more adequate description. While Homer was actively put into this state of mind by the boys (ἐξηπάτησαν in aorist form), people are, as it were, constantly deluded by themselves: ἐξηπάτηνται in the middle voice of perfect aspect. Thus, by understanding the mischief done to Homer, we will be able to gain some insight into the prevailing epistemic condition in which Heraclitus thinks we all are constantly entangled.

Homer's delusion may be comparable to the general delusion, but it is by no means obvious to what the latter relates. In the legend, the question is whether and what the boys have caught on their fishing trip, and the delusion is caused by the somewhat peculiar answer of which Homer failed to make sense. That which is to be illustrated by this legend Heraclitus says to be γνῶσις τῶν φανερῶν, the cognition of apparent things. Now unto itself this almost amounts to a paradox. For whatever it may be that is said to be apparent, by its very being apparent it must be supposed to be accessible to knowledge. Being apparent is opposed to being unapparent or veiled; matters that are "public," that is, publicly known or at least knowable, as against what is secret.[6] Given Heraclitus' frequent hints that he is concerned with what is in some way hidden and elusive we would rather expect the claim that people are mistaken precisely in what is not so apparent.

At first glance, it may be tempting to suggest a simple solution. The whole phrase "not recognizing what is apparent" can be taken to designate not a certain range of objects of knowledge but rather to emphasize the failure of men. So it would boil down to nothing more than an underlining of their incapacity for knowledge *despite* things being apparent. In line with this interpretation is the proposal to take into account Homer's blindness.[7] So just as Homer was physically not able to see, so the upshot would be, people are metaphorically blind with respect to the *logos*. Yet, although Homer's puzzlement is indeed reminiscent of the incomprehension people are said to experience in B 1, this solution will not do. Not only is Homer's blindness not mentioned in Heraclitus' version, but the implication of this reading would be that the only thing that can be learned from the fragment about the right approach to cognition is that it is the opposite of being blind. It would just amount to something like opening one's eyes and taking a straight look at what – allegedly – is apparent before us. So what is meant by apparent would consequently not be apparent in the vulgar sense, but only to the philosopher's eyes. Heraclitean insight would thus have to be reached by some sort of direct intuition, but we would not gain any indication as to how to achieve it. On this reading, the fragment would be uninformative on the crucial point.

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[6] Cp. the various instances in LSJ s.v.

[7] Cf. Kahn, *H.* 111–12.

Furthermore, and more importantly, this reading would positively spoil the point of the riddle. Within the situation of the legend, it follows that Homer would have been able to understand the riddle if only he still had had sight. This way he would have been able to observe the doings of the fisher-boys and just *see* they had been catching lice. However, if Homer, or anyone else, had visual access to what was going on there would be no need for a riddle in the first place. If the solution is available visually, then a riddle has no point. A riddle calls for sagacity, not for better observation or gaining more external information. The fact that Heraclitus here calls Homer the wisest of the Greeks serves to underline that what it takes to solve a riddle is above all *wisdom*. So in highlighting the basic human failure this fragment gives an indirect clue as to how to be wise.

Riddles are there to be solved by *thinking* about them, by finding the right answer through listening to the words and making sense of them. It is for this reason that the form of a riddle is congenial to the character of Heraclitus' thought. When confronted with a riddle one is prompted to reconsider the implicit preconceptions one has about what is at issue. Often the solution can be found if the words are taken in an unusual way whereas if one clings to the normal expectations it remains enigmatic.[8] So, not being able to solve a riddle—the situation of Homer—indeed comes close to what is said of men in B 1: they hear the *logos* but they remain uncomprehending. What they "hear" from Heraclitus is certainly not just noises, but words they understand and sentences they can follow. What they hear even has a meaning to them but they *still* cannot make sense of it. Or rather, precisely because they can make some "sense" of the sentences they read they conclude that it seems to be nonsense. It all appears absurd to them just as the boys' riddle seemed to Homer. This allows for the conclusion that B 56 is actually meant to provide, by means of a comparison to a tricky, but comprehensible situation, an analysis of the problem of coming to terms with Heraclitus’ *logos.*

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[8] Cf. the extensive material of ancient riddles collected by K. Ohlert, *Rätsel und Gesellschaftsspiele der alten Griechen*, Berlin 1886.

As far as Homer is concerned, it is clear that what he had expected was the kind of thing that is usually caught by fishermen. So, what he could not move his mind away from is the usual way of thinking, and his failure results from clinging to what appears self-evident and obvious, or in the words of B 18, he was not able to “expect the unexpected” and therefore could “not find what is hard to track.” In other words, he was deluded πρὸς τὴν γνῶσιν τῶν φανερῶν, he was mistaken *in basing his attempts to gain knowledge on what appears to be apparent.* So the term “apparent” can suitably be understood from the delusory situation itself. The implicit claim is not that he failed to recognize what is apparent, but rather that what he ought to have done is to question his expectations and to direct himself towards what is not apparent. Within the framework of the legend, this realm of the hidden is materialized by the lice.

So, as also urged by B 54, we are advised to turn to what is unapparent. But this advice is by itself again uninformative as it gives no guideline how to proceed. Homer was stuck *although* he realized that the answer apparently was not the obvious result of hunting. The only guideline for Homer was to find the clue in some way in the words of the riddle, and as Heraclitus thinks we are in no other situation we finally have to pay attention to the wording itself.[9]

In presenting his version Heraclitus apparently assumes the legend to be known. The background story is condensed to the minimum while by contrast the enigmatic words the boys utter are quoted in full. Compared to the various versions of the *Vitae Homeri*, Heraclitus even has expanded the saying. There we have (with slight variations) the following line of hexameter:

> ὅσσ’ ἕλομεν λιπόμεσθ’, ὅσα δ’ οὐχ ἕλομεν φερόμεσθα.

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[9] Even those interpreters who have dealt with B 56 usually shy away from analyzing the riddle. Cf., e. g., Uvo Hölscher, *Anfängliches Fragen* (Göttingen 1968) 138, “Auf die Lösung des Rätsels kommt nichts an, es geht lediglich um die Form als Rätsel, und die besagt: auch die Dinge stellen ein paradoxes Geheimnis dar, das gleichwohl am Tage liegt; sie sind selber ein Rätsel, das zu lösen ist – man muß nur die Chiffre lesen können, das heißt, man muß das Sichtbare als Zeichen verstehen lernen, als das Sich-Anzeigen des Unsichtbaren.” Yet how could we learn to read the “chiffre” without attending to the riddle? Without a λόγος for solving the riddle the solution would amount to sheer intuitional guesswork.

Heraclitus' version, ὅσα εἴδομεν καὶ ἐλάβομεν, ταῦτα ἀπολείπομεν, ὅσα δὲ οὔτε εἴδομεν οὔτ' ἐλάβομεν, ταῦτα φέρομεν, differs in two significant points: first, he uses the present tense ἀπολείπομεν instead of the aorist form. He envisages not a unique action in the past, something that the boys did before meeting Homer; instead, this action is to be understood as *ongoing*, on an equal level with and simultaneous to the other part of their activity, φέρομεν. Leaving behind and carrying along are presented as interrelated aspects of the same activity, the first relating to what has been caught, the latter to what has not been caught.

Second, while the traditional verse just has ἕλομεν for designating the action of catching, Heraclitus instead speaks of εἴδομεν and ἐλάβομεν, that is a double action that is evidently chosen to suit better to be transferred to the problems of cognition. This choice of words is remarkable by itself. Without any tradition of epistemological vocabulary at hand, Heraclitus here uses in conjunction those two terms that will later play a fundamental role in the history of metaphysics and epistemology: seeing, as the sense which gives the best and most differentiated access to the world, stands for sensory perception in general, or even metaphorically for intellectual intuition. On the other hand, "taking" denotes the intellectual side of cognition. In Greek, αἱρεῖν (the word in the versions of the *Vita Homeri*) is not often used in an epistemological context, whereas λαμβάνειν (the word chosen by Heraclitus) is here quite usual; it means "to apprehend, to take something as, to understand."[10] In Latin the equivalent is *con-cipere*, whence *conceptus,* and in modern languages various expressions of "grasping" (in German *Begreifen* and *Begriff*); all of them make use of the metaphor of laying hands on something and seizing it so that it will be understood and "possessed" by the mind.

Now, what is even more remarkable is that by employing the riddle for explaining cognition, or more precisely the common failures of cognition, Heraclitus apparently sets out to undermine this view: "What we have seen and taken, we leave behind; but what we have not seen and not taken, we carry with us." In both the literal and the metaphorical sense, this comes as a paradox; it fundamentally clashes with what is believed to be the natural order of "grasping" something. What is to be caught or conceived is usually sought after in order to acquire it. It is something that cannot be left behind as it is not "had" in the first place, and that is the very reason for going after it. The intention of catching something is to possess it and to carry it home. Transferred to cognition: grasping something is done by conceiving, that is, by forming a "concept" of it through which the matter in question is "had" by the mind.

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[10] LSJ s.v. A I 9.

Here we arrive at the core of the delusion. In B 56 we do not learn only that Heraclitus' insight comes like a riddle that is to be solved by questioning our usual beliefs about the world. The message of the fragment is not confined to recommending in an undetermined way to expect the unexpected or to turn to the unapparent. Rather, we are offered a positive analysis of what is wrong with the usual conception of cognition. What Homer could not make sense of is the reversal of the business of catching; in the present case, it does not aim at acquiring and possessing, but at getting rid of something.

Homer may be imagined as pondering what on earth the boys might have caught, if it apparently was not fish. He might have been prepared to look for other possible and impossible objects of their hunt. Still, this would only have resulted in ignorance. His puzzlement is not just the result of being unable to find a solution, a suitable object fitting the description (such as might have happened if the answer to the riddle were too far-fetched). His delusion arises from realizing that there can be no such object in principle — given, that is, his unquestioned assumptions concerning what catching is all about. Homer is positively in a predicament; the harder he looks for a solution, the more impossible it appears to be.

It is interesting to note how Herrmann Fränkel accounts for the unusual action: "What men see with their eyes and grasp with their hands, they throw away without understanding it and making it their own, but the true realities … they carry like lice in their clothing which escape both their eyes and their hands."[11] While Fränkel's remark about where the true realities lie surely hints at the right direction, he still seems not to realize the consequences of following this hint. If what is sought here is something that lies hidden, like lice, near or on oneself, then grasping it will of necessity not be done in the usual way. By regarding the action of throwing away as a failure, Fränkel himself mistakenly confuses the peculiar business of the boys with the human error that is illuminated here. Yet, what the boys are doing is clearly not meant to *illustrate* the human failure itself, but on the contrary to be that which *causes* the delusion. It is Homer's state of mind that is the point of reference for understanding that of people. Fränkel's interpretation is illuminating as it also betrays the reason for this confusion: he explicitly equates understanding with "making it their own." Obviously, he could not make sense of throwing away as being an essential part of the troubling phenomenon, and so he believed it was part of the attitude that Heraclitus wanted to criticize. This is a striking example of the power of the conventional paradigm that understanding is essentially about making something one's own and possessing it.

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[11] H. Fränkel, *Early Greek Poetry and Philosophy* (Oxford 1975) 372–3. Fränkel appears to be the only interpreter who has tried to analyze the riddle itself.

If the scene at the beach is to serve as the model for understanding in which way people fall short in cognition, then it will not do to point vaguely at some sort of hidden reality. What is at stake is not just a peculiar and possibly remote object of cognition that is to be found out by unusual means. It is the very nature of understanding itself that is in question here, its direction and its manner. What is highlighted by the legend is not a simple error or failure; it is (in modern parlance) a category mistake.

Two conclusions can be drawn from B 56. The first comes as no surprise. The main reason for Homer's not solving the riddle proves to be his conviction that what one is after is something external to the person doing the hunt, something that is to be caught by approaching and finding it. Transferred to the problems of cognition, this means that in Heraclitean philosophy we are not dealing with anything resembling knowledge of external objects in the world, be it the harmony of the cosmos or a universal cosmic law or a unity in all phenomenal opposites. Whatever it is, it must not be conceived of as anything "objective," lying there like an object to be discovered, to be seen and grasped by the philosopher's mind. True knowledge concerns something to which one's relation is not external, and it involves the person who is trying to understand in a special way.

This claim is just the epistemological consequence of the main theme of the Heraclitean discourse. In B 1 it is stated that the subject matter will be the words and deeds of men of which they are peculiarly unaware.[12] Accordingly, the way in which Heraclitus thinks he is distinguished from them is precisely that he has made the effort to go in search of himself (B 101). Knowledge of oneself is apparently in some way the main concern of Heraclitus' philosophy, and it is this sort of knowledge that we are supposed to seek. In B 56, this is symbolized by catching lice on oneself, as against hunting for fish or any other objects in the world.

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[12] For a detailed interpretation of B 1, see Dilcher, *H.* ch. I.

The second conclusion from B 56 is more perplexing. The riddle also shows how the nature of what is to be known has implications for the right way to deal with it; in the imagery of the legend, lice are not caught in the same way as fish. Now, the appeal to go in search of oneself could be understood as retreating from the "outward" world and concentrating on the state of the soul or some "inner" self. While we do find in Heraclitus much attention to the soul and its states (for the first time in philosophy), Heraclitus' *logos* apparently does not exclude consideration of the cosmos and the so-called physical world. B 56 may help to get the point right. The riddle indicates that for Heraclitus it is not any form of introspection that is called for, but rather a different mode of understanding—of oneself as well as of the world one lives in. The boys' action involves not only a reversal of direction by turning to oneself, instead of reaching out into the world. While it is conceivable that lice (or anything similarly close to oneself) are to be caught simply by laying hands on them and keeping them, the crucial point that causes the delusion is that the lice are caught in order to get rid of them. This may appear natural in respect to lice, but it is not natural any more if this action is to serve as the clue for understanding what understanding oneself is about.

While self-knowledge is in some way or other a standard theme in the philosophical tradition, it is this *reversal* of the action of gaining such knowledge which requires explanation. As the riddle so pointedly and effectively puts it, the knowledge in question is nothing that after being "taken" can be had and as it were be carried along (φέρομεν). Self-knowledge not only cannot be *gained* in the same way as knowledge of external objects, it is, according to Heraclitus, not even something that can be gained in the strict sense at all, in the sense of making it one's own and possessing it; rather, it is to be left behind (ἀπολείπομεν). So whatever the procedure is like, in the end nothing is left in our hands, and the effort will be in vain; at least so it will necessarily appear to standard beliefs.

When turning to Heraclitus' claims to knowledge, our first (and to many interpreters also the lasting) impression appears to be that he believed himself to have discovered the one and only truth which all mankind fails to recognize. This universal claim seems to be presupposed by his many attacks against men in general and almost all intellectual authorities in particular (B 56 appears to be just another instance of this on first reading). Yet, on closer inspection it is rather difficult to substantiate this impression by any explicit claims to such universal knowledge. In contrast with Parmenides, Heraclitus never uses the word ἀλήθεια to mark his own insight (B 116 being a general remark on wisdom). Even more striking is the fact that Heraclitus often speaks of γιγνώσκειν, but always in a negative way: people are regularly criticized for not recognizing something.[13] Including B 56, there are no fewer than eight instances of this kind. The evidence is even clearer with the word γνώμη. In B 41, to understand γνώμη is attributed to the one Wise, and in B 78 we have the statement that human ethos has no γνῶμαι, while divine ethos has. Finally, there is the absence of γιγνώσκειν where you would expect it most: given the central importance of self-knowledge, Heraclitus may be supposed to claim to have achieved at least this. In fact, however, he only makes the assertion: "I went in search of myself," ἐδιζησάμην ἐμεωυτόν (B 101). Heraclitus may have considered it a major step to do this, and it apparently was a point he felt was important enough to pronounce, but still it is a modest claim. This is all the more striking when the saying is understood as in some way reacting to the Delphic maxim γνῶθι σαυτόν. In this context belongs also B 45, which forcefully states the inscrutability of the soul: "The limits of soul you will not find out, even if you travel any road. So deep is its reasoning." So it should not be assumed that the Heraclitean *logos* either proceeds from or aims at a standpoint of insights that can be "taken" as "knowledge" in any usual sense.

Heraclitus apparently did not find it suitable to present his insight in the epistemic terms of truth and knowledge that seem so natural (if not unavoidable), and which were to be the core of philosophy and science later on, – and this despite or rather because of his vivid interest in the various modes of knowledge. Instead of gaining for oneself a result, like a big fish from which one can make a living, Heraclitus presents an activity of letting go of what has been seized. As this is the opposite of what we expect knowledge to be, it may be tempting to conclude that Heraclitus has the negative aim of a skeptic who takes pride in getting rid of all opinions, as he thinks no truth is in human reach. This conclusion is equally unsatisfactory, however, as, irrespective of claims to truth, it in no way matches the presentation of ideas which we find in the Heraclitean fragments. Heraclitus' *logos* may be evasive but it is not negative in the sense of aiming at emptiness.

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[13] This important discovery was already made by B. Snell, *Die Ausdrücke für den Begriff des Wissens in der vorplatonischen Philosophie* (Berlin 1924) 66–7. See also his pertinent remark in "Die Sprache Heraklits," in his *Gesammelte Schriften* (Göttingen 1966) 136 n. 3: "'Erkennen' kann für Heraklit höchstens eine göttliche γνώμη, menschliches γιγνώσκειν bleibt immer im Unzulänglichen stecken—aber darin zeigt sich, wie schwach in ihm der Impuls zum 'Erkennen' war und der Glaube, damit an ein wertvolles Ziel zu gelangen. Eine Resignation gegenüber dem ihm wesentlichen Wissen liegt Heraklit durchaus fern."

Maybe the legend with the riddle has been overstretched in the attempt to extract some sort of Heraclitean epistemology. Or maybe rather, it has not yet been read carefully enough. For what Heraclitus says the legend will illuminate is not the right way of reasoning, but the delusion of men. It is only on the background of their preconceptions about knowledge that a peculiar epistemic activity which does not end in getting hold of anything will appear negative, disappointing, and vain. The sceptical idea of deconstructing claims of knowledge is still based upon the concept of knowledge as *acquiring* a correct view, only that this is considered to be impossible. What Heraclitus presents, by contrast, is the way in which the pre-philosophical view cannot make sense of the reversed activity in question. What is called for is not quite giving up all aspirations to knowledge, but rather abandoning the standard beliefs about what "true knowledge" is like.

Where this will lead is still unclear. B 56 is unique in explaining the epistemic illusion of mankind, but it is not unique in addressing the epistemic idea which is to be gained here. Already in B 2 men are criticized for making something their own, for creating a private understanding whereas the *logos* is something ξυνόν. Thus it is *logos*—to be translated as reasoning—which stands for the philosophical way of thinking that avoids the shortcomings of the conventional understanding of knowledge. The word ξυνόν here is hard to translate. Usually it has been fitted into a more general picture according to which men are like sleepers caught in a private world of their own (with the Stoic formulation in B 89). Heraclitus' appeal would then be that one arises from slumber and open one's eyes in order to see the common world in which we all live. On this construal, however, the main way to gain insight would again be modeled after the paradigm of seeing something external; it would amount to some sort of immediate intuition of what is obvious. The problem addressed in B 2, however, is that of adequately comprehending the *logos*, and for this reason the model to be referred to for gaining the right way of thinking is not seeing but hearing in its full sense:[14] what is heard is primarily not noises but words, and not just words, but words meaningfully strung together—in Greek, λόγος. It is therefore misleading to construe Heraclitean insight by way of a model of sensory perception; that is, by any sort of immediate awareness or direct intuition. As both B 1 and 56 tell us, what is to be achieved is understanding and making sense of words deliberately strung together, and the suitable Greek word for this is ξυνιέναι, to bring together.[15] People remain uncomprehending (ἀξύνετοι, in B 1) as they fail to bring together the words of the Heraclitean *logos*, just as Homer failed to make sense of the boys' riddle. Also the word ξυνόν in B 2 ought to be interpreted in the same direction. And a failure to bring it together (οὐ ξυνιᾶσιν) is what happens to people also in respect to the back-stretched harmony of B 51. In the light of B 56, it appears that these are different manifestations of the same mistaken attitude. Therefore, "not comprehending the back-stretched fitting"(B 51) can be read as another comment on what it specifically is that makes the Heraclitean *logos* difficult to understand; for if they fail to bring together those artfully und deliberately composed words of Heraclitus this failure concerns the adjustment of those words, their connection and specific structure, in Greek their ἁρμονία. Thus, the problem of conceiving Heraclitean harmony is in fact coupled with the basic human problem of coming to grips with the *logos*, and an explanation for this predicament is offered by B 56.

Now, the main factor for not understanding could be determined as the tendency to make "what was seen and taken" one's own so as to possess it. There is another fragment that may shed further light on what this may amount to, B 28: δοκέοντα γὰρ ὁ δοκιμώτατος γινώσκει, φυλάσσει. Whatever the correct wording may be,[16] the gist of the fragment is again criticism of knowledge, here expressed by the paradoxical phrase δοκέοντα γινώσκει: he, whoever this δοκιμώτατος is supposed to be, recognizes what is only δοκέοντα. As everyone familiar with Parmenides knows, the translation of δοκ-words is notoriously difficult, as it can range from δόξα in the plain sense as "view, opinion" to more negative senses such as "seeming, mere belief." The latter meaning occurs for instance in B 17, there in opposition to γιγνώσκειν: "they do not learn and know, but they form beliefs of their own," οὐδὲ μαθόντες γινώσκουσιν, ἑωυτοῖσι δὲ δοκέουσι. Again, we encounter the idea of having something for oneself (ἑωυτοῖσι), which here can be understood as leading to the fabrication of *doxa*. It is likely that δοκέοντα in B 28 should be understood on the same lines. Now, the interesting information in B 28 is that γιγκώσκειν is here coupled with φυλάσσειν, which is the exact opposite of ἀπολείπειν. It is therefore advisable to take φυλάσσειν here as specifying this epistemic activity. Normally one guards and protects something from getting lost, one cares for it so that it may remain intact. Not to let go but to guard something one has "taken" in cognition will accordingly mean that it is transformed into a *doxa*, a firm view one entertains about the matter in question. Such a fixed belief is what one can carry along and thereby become a δόκιμος among men—just as, for instance, Pythagoras who, Heraclitus says, contrived even a wisdom of his own (ἐποιήσατο ἑαυτοῦ σοφίην, B 129).

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[14] B 101a "Eyes are better witnesses than ears" has often been taken as the basis for a Heraclitean epistemology. Given the lack of context, however, it is difficult to determine the scope of this saying. Rather than valuing one sense over another, this fragment is presumably concerned with criticizing the reliance on hearsay (cp. K. Robb, "The Witness in Heraclitus and in early Greek law," *The Monist* 74 (1991) 664 ff). As B 107 demonstrates, sense perception as such is for Heraclitus something that needs interpretation. So we are in any way led back to the problems of properly understanding a "language."

[15] Cf. Snell *Ausdrücke* (above, n. 13) 48: "diese Beziehung zum menschlichen Geist ist durch συνιέναι deswegen gegeben, weil es von der Wahrnehmung durch das Ohr ausgeht. Dessen Objekt ist menschliche vernünftige Rede, während das Auge auf die Gegenstände des Raumes gerichtet ist, deren Ordnung es erkennt." According to Snell 41, the basic meaning in Homer is to be rendered as "etwas durch das Gehör in sich aufnehmen und ihm geistig folgen."

A recurrent epistemological theme emerges in Heraclitus' criticism of human incomprehension. The contrast between "letting go" and "carrying along" is vital to understanding the Heraclitean *logos*. The mistaken, though common and in fact natural attitude leading to incomprehension results in forming beliefs and "con-cepts" by which "what has been seen and taken" can be carried along. If this way of understanding as making something one's own ends in forming fixed doctrines, then another fragment that has rarely been interpreted calls for consideration. B 70 has something to say about human *doxai:* παίδων ἀθύρματα τὰ ἀνθρώπινα δοξάσματα, "children's toys are the human opinions." Again as in B 56, we hear of playing children.[17] Playing is what the boys do with Homer, and what they play with is precisely Homer's opinions. Likewise Heraclitus plays with his readers. So B 70 might suitably be understood as expressing what human beliefs are there for: to be played with. This might be an indication of a possible way to deal with that epistemic predicament.

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[16] The grammatical forms of the first and the last word as given above are the most common accepted emendations; cf. Marcovich fr. 20 (p. 78 ff).

[17] As B 52 (αἰὼν παῖς ἐστι παίζων κτλ) shows, Heraclitus ought to be taken seriously in what he says about the role of playing children in human life. For interpretation, I may again refer to Dilcher, *H.* 153 ff.

To sum up: the initial question was how to conceive Heraclitean harmony, and after realizing the problems inherent in formulating a coherent concept or doctrine of harmony (or unity) we now reach the result that attempting to gain and fix any such doctrine is precisely the mistake humans tend to make. The problem with the Heraclitean concept of harmony turns out to be that harmony is not to be conceived. Even more, any concept or doctrine in its normal sense, so at least it seems, will fail to make sense of Heraclitus' *logos*. This epistemic idea that can be gained from B 56 may still appear puzzling, but it is no more and in no other way puzzling than the character of Heraclitus' *logos* itself. In fact, it proves to be a very precise description of the use of concepts or "themes" that can recurrently and on different levels be observed in Heraclitus. What is once taken up as the subject of discourse or as an explanatory notion will then be abandoned again, or it will reappear with different and new connections.[18] So B 56 in fact points at an essential feature of the *logos* by issuing a warning. If we proceed on conventional epistemological assumptions, we shall wreak havoc on the *logos* and fail to conform with its specific structure, and that is, with its harmony.

How a more positive way of coming to terms with Heraclitus' *logos* might look is still out of reach. Yet in B 56 there is an indication. Heraclitus does not put us in the situation of Homer not knowing how to solve the riddle. Instead, he tells us the solution right from the beginning: the boys, he says, were killing lice, φθεῖρας κατακτείνοντες. By knowing this solution, the reader is able to understand Homer's delusion. The words that illuminate for us the situation at the beach may also illuminate for us, in a way, the meaning of this whole business. After all, the boys' killing of lice is the reason, in the framework of the legend, for the thoroughgoing negativity that shatters all attempts to get straightforward answers from Heraclitus—after reading B 56 no less than before. In the pictorial language of the legend, this is the result of presenting a trifling activity like killing lice instead of bringing us the expected catch of fish that would give us a mouth-filling meal. Likewise our hunger for anything definite is frustrated; no doctrine to fill our intellectual appetite is forthcoming. Even so, killing lice is useful, in that one thereby gets rid of something annoying. What one gets rid of is in Greek called φθεῖρες, and this word may well be understood from the root φθείρειν, "to destroy, ruin, eliminate." So somewhat secretly we here have two words for the same negative activity. The boys are bringing death to the lice which in fact are themselves called destroyers. The peculiar activity could thus be rendered as *killing the killers.* What this may mean for the nature of true understanding must remain open, but it seems to have something to do with keeping oneself alive.

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[18] Some descriptions can be found in Dilcher, *H.* ch. 6.

So, B 56 in the end sheds some important light on Heraclitus' thought as a whole. In view of the fact that it is the only fragment that actually explains what is wrong in the belief and practice of the normal pre-philosophical way of thinking, it is a guideline as to how to deal with Heraclitus' main insight. Considering the epistemic predicament that mankind is in according to Heraclitus, one may well say that without heeding the claims of B 56, the *logos* will forever remain incomprehensible (just as he says in B 1). In this way, this fragment holds the same fundamental function as does in Plato's philosophy the simile of the cave: showing the way out of human shortcomings by engaging in philosophy. Surely, Heraclitus is more reticent about what the wise will experience. Instead of a colorful imagery (as in Plato), we are confronted with a deceptive but inconspicuous riddle. Yet, by paying close attention to what it says, we can not only rid ourselves of some delusions, but what we are in fact also doing is, to some extent, *listening and conforming* to the *logos.* Only for those who expect big fish will, whatever they see and take, be and remain a lousy tale.

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10. Heraclitus on *Logos*

Language, Rationality and the Real

Enrique Hülsz

Almost[1] all interpreters of Heraclitus have always had a ready answer to the question: "What was Heraclitus?"[2] The mainstream reply assumes as self-evident that he was a philosopher. In what follows I, too, will take for granted that he was a philosopher, but I shall start by pointing out that universal attribution of a philosophical character to Heraclitus' thought does not really imply monolithic unanimity, since the term "philosophy" can be (and usually is) understood quite equivocally. And I would like to insist that Heraclitus (and, for that matter, all other Presocratics) probably did not use the words "philosophy," "philosopher," or "philosophize," and so could not think of himself or of his own activity as a thinker in these terms.[3] Thus the concept of φιλοσοφία, as a regulatory hermeneutical idea, is most of the time presupposed, and the validity of its attribution to Heraclitus is hardly ever fully acknowledged and argued for. In point of fact, and even if there are good grounds for doing so, when we call the Presocratics "philosophers," we are projecting retrospectively a language that was shaped at a later time, mainly by Plato and Aristotle, from which everybody else took it. Although there is some continuity in the shaping of the idea of philosophy from Plato to Aristotle, there are also striking differences between their respective conceptions, including their historical approaches to the Presocratics, particularly to Heraclitus. In Aristotle, he appears as a self-contradictory thinker and writer, and as one of the φυσικοί, his peculiar monistic thesis about the ἀρχή being fire. The image of Heraclitus in Plato is more nuanced, less physicalistic, centered as it is on flux and the unity of opposites. I therefore want to emphasize the relevance of the question of the nature and the origins of philosophy for any interpretation that chooses to see Heraclitus precisely as a philosopher.

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[1] Agustín García Calvo's views about the non-philosophical character of Heraclitus's thought are among the few exceptions that I know of. See A. García Calvo, *Razón común. Edición crítica, ordenación, traducción y comentario de los restos del libro de Heraclito* [sic] (Madrid 1985). Although Giorgio Colli, in *La sapienza greca,* III. *Eraclito* (Milan 1980), sometimes seems to deny him implicitly philosophical status because he usually calls him a sage ("un sapiente"), one can find also in his valuable work statements like this: "La filosofia di Eraclito, per il fatto che esprime la verità assoluta, può dirsi senz' altro il λόγος" (172).

[2] The lucid treatment of M. L. West happily puts it in just these words. See M. L. West, *Early Greek Philosophy and the Orient* (Oxford 1971). West certainly seems to credit Heraclitus with a philosophy, and I believe that he is right when he affirms that physical cosmology was "not central in Heraclitus' thought." As to what sort of philosophy, then, Heraclitus' was, West interprets it (closely following K. Reinhardt, and perhaps not so far from Burnet) as having "a religious end-purpose." My drift is that Heraclitus' philosophy lies rather in his metaphysics, understood as a rational methodic and systematic concern with knowledge and the real. See E. Hülsz Piccone, *Lógos. Heráclito y los orígenes de la filosofía* (Mexico City 2011).

[3] The verb φιλοσοφέω and words of this family are first attested in fifth-century authors (notably Herodotus) but are wholly absent from all genuine Presocratic fragments. The sole exception which could be pointed out is a fragment of Heraclitus' (B 35), but in all likelihood, as Marcovich shows in his *H.*, the ref-

In this paper I shall try briefly to articulate a general view about who Heraclitus the philosopher is. My thesis is that he is both a metaphysician (an ontologist and epistemologist) *and* a moral philosopher. I shall take λόγος as the center of my sketch, and against semantically reductive interpretations I will argue that the full meaning of *logos*—a word best left untranslated in the texts—involves the notions of language, knowledge, reality and action, a complex unity pervaded by a common rationality. I will focus first on the metaphysical dimension of *logos*, and suggest that this is the ground on which Heraclitus builds his idea of man's nature (which is centered in knowledge, itself essentially connected to both being and action, the ontological and the ethical dimensions). Attribution to Heraclitus of a theory on *logos* depends partly on whether one acknowledges its ontological status, and partly on whether one accepts that there is semantic unity and philosophical consistency throughout all documented instances of Heraclitean usage.

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erence there to φιλοσόφους ἄνδρας is Clement's, not Heraclitus'. Cf. P. Hadot, *Qu'est-ce que la philosophie antique?* (Paris 1995). All references to fragments of Heraclitus are made according to DK, ch. 22, although the Greek text assumed is mostly that of Marcovich's edition. Translations into English are my own, unless otherwise noted.

Telling the *Logos:* Heraclitus as Metaphysician

It is remarkable that Heraclitus himself explicitly describes his own attitude and procedure in terms which amply justify the ancient opinion that the thinking he displays is philosophy indeed, even if he would not actually word it like that. In the opening of his book,[4] after dealing with men's lack of understanding about a *logos* which is always the same (literally, "always this") and by which all things happen, he offers the earliest recorded description of what came to be called philosophy, when he goes on to characterize his own procedure as διήγησις, a "narrative explanation"[5] dealing with "words and deeds," "according to nature" (κατὰ φύσιν[6]). Yet more precisely, he presents his own rational explanation as διαιρεῖν, a "dividing" of each thing and a "showing it forth" (verbally[7]) "as it truly is" (φράζειν ὅκως ἔχει). What we can call his philosophy and his method, he presents as the unfolding or telling of the true and universal *logos*, closely linked to knowledge (explanation, analysis and manifestation) of genuine being as φύσις.[8] In fact, the formula περὶ φύσεως ἱστορία, an "investigation on the nature of things," first documented in Plato,[9] which became (through Aristotle) the basis of the standard generic characterization of "presocratic" philosophy, is likely based on Heraclitus' actual language. Plato's view differs from Aristotle's significantly in that Heraclitus is treated as a metaphysician rather than as a "natural philosopher"[10].

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[4] For the Greek text, see below, note 12. That B 1 is the ἀρχή of the book relies on the authority of Aristotle and Sextus Empiricus, and is nowadays widely accepted. Not implausibly, many have proposed that it could have been preceded by a few words like "Heraclitus of Ephesos says as follows". It remains possible that other preserved fragment or fragments preceded B 1 (B 50 is a recurring candidate); cf. L. Tarán, "The first fragment of Heraclitus", *Illinois Classical Studies*, XI, 2; S. Mouraviev's recent reconstruction (*Heraclitea*, IV.A, 2011) conjectures a series of nine fragments before it. Some think that B 1 and at least B 114 and 2 (in that order) belong together here and form a neat proem.

[5] The Greek noun διήγησις, meaning something like "narrative exposition" and/or "explanation," corresponds to the verb actually used, διηγεῦμαι ("set out in detail," "describe"; LSJ *s.v.*).

[6] Heraclitus' use of φύσις is arguably the oldest preserved within the philosophical tradition (since he probably wrote earlier than Parmenides, and the term is not documented in the scarce authentic fragments of Anaximander and Anaximenes). Φύσις is one of Heraclitus' main philosophical watchwords endowed with considerable "linguistic density," to use Kahn's words. Note in the passage quoted from B 1 the *apo koinou* construction of the adverbial phrase κατὰ φύσιν, affecting all three surrounding verbs. For the three other instances of the word in the fragments, see B 112, 123, and 106—the last probably not a full verbatim quotation. Put in direct style, φύσις ἡμέρης ἁπάσης μία ἐστι would be a minimalistic and reasonable version of the saying. See Mouraviev*, H.* III. 3. i–iii for his reconstruction of B 106.

[7] This seems to be the best sense for φράζων in context, and one that is consistent with usage at Heraclitus' time. Cf. LSJ *s. v.* φράζω, 2, "show forth," "tell," "declare."

Heraclitus' stance contrasts with the oblivious disposition of "other men," who are likened to sleepers (thus projecting back the idea of awareness as a fundamental trait in Heraclitus' own philosophical attitude). Because of this self-awareness, a certain self-reflexivity goes well with λόγος from the very start. In any case, λόγος is undeniably present as an explicit topic at the starting-point or ἀρχή of Heraclitus' book, so it appears to be a true principle at least in a literary, and especially in a narrative, sense. It can be seen as an ἀρχή in a fuller philosophical sense, too (although not as either a "material" or an "efficient" cause).

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[8] *Pace* H.-G. Gadamer's opinion that φύσις carries no philosophical import yet in Heraclitus; cf. H.-G. Gadamer, *Der Anfang der Philosophie* (Stuttgart 1996) 41–42 = 34–35 of the Enlish translation. The opposite view of the idea of φύσις as an early basic metaphysical concept was, of course, defended by M. Heidegger in his *Einführung in die Metaphysik* and essays "*Aletheia* (Heraklit, Fragment 16)" and *"Logos* (Heraklit, fr. 50 DK)" (all in the *Gesamtausgabe*, Frankfurt, various dates). Although Gadamer says he agrees with Kirk (in KRS), his claim misrepresents the latter's own statements, which do not really back that φύσις has no philosophical weight whatsoever in Heraclitus. In the better and wider treatment of B 123, Kirk actually states that "the broad general sense of φύσις, from which all specialized senses are derived, is 'essence' or 'nature,' the way a thing is made, […] the way it normally behaves," and that "the most common early sense of φύσις is 'being,' though the idea of growth is not excluded and may be emphasized on particular occasions." See Kirk, *H.* 227–231, esp. 229. This is a far cry from φύσις not being philosophically significant in Heraclitus, even if it does not mean "Nature," as it allegedly does in Aristotle.

[9] *Phaedo* 96a7. It is crucial for getting the right sense in context not to translate as "nature" *tout court*, but as "the nature of things."

[10] For Plato's reception of Heraclitus, see T. Irwin, "Plato's Heracliteanism," *PQ* 27/106 (1977) 1–13; M. Adomenas (2002), "The fluctuating fortunes of Heraclitus in Plato" in A. Laks-C. Louguet (eds.), *Qu'est-ce que la philosophie présocratique* (Villeneuve-d'Ascq 2002) 419–447; See also E. Hülsz Piccone, "Sócrates y el oráculo de Delfos (una nota sobre Platón, *Apología de Sócrates* 20c4–23c1)," *Theoría* 14–15 (June 2003) 71–89, and "*Anámnesis* en el *Menón* platónico," *Apuntes filosóficos* 22 (2003) 61–79. See id., n. 2 above, as well as id., "La imagen de Heráclito en el *Cratilo* y el *Teeteto* de Platón," in E. Hülsz (ed.), *Nuevos ensayos sobre Heráclito* (Mexico City 2010) 361–389; and id. "Plato's Ionian Muses: *Sophist* 242 d-e," in B. Bossi and T. M. Robinson (eds.), *Plato's* Sophist *Revisited* (Berlin 2012).

The Proem in Heraclitus' book could have run something like this[11]:

> [B 1] Although the *logos* is this always men become uncomprehending both before hearing and once they have heard it. For about all things that happen in accordance to this *logos*, they are like the unexperienced experiencing words and deeds such as those I set out in detail according to nature distinguishing each thing and showing it as it truly is. But other men neglect all things they do awake just as all things they are oblivious of while asleep.
>
> [B 114] Those who speak with sense must strengthen themselves with that which is common to all, just as the city with the law, and more strongly still. For all human laws are nurtured by a single one, the divine [law]. For it commands all as much as it wants to, and it suffices for all and is still left over.
>
> [B 2] That is why one must follow what is common, but although the *logos* is common, most people live as if they had a private wisdom of their own.[12]

Much that concerns the purpose and nature of Heraclitus' philosophy hangs on just what the word *logos* means here. That the meaning is a rather complex one is the view most widely held among modern scholars,[13] though there are some exceptions. A line of interpretation going back to John Burnet keeps regularly reappearing. According to this view, we would be facing an expression that does not entail any particularly interesting philosophical overtones, the meaning of which would be fairly simple, even trivial and standard. A common element in different representatives of this view is the stress laid on the exclusiveness of the generic meaning of "language," a move that usually turns out in translations of *logos* as "Word," "discourse," "account," and the like.[14] Oddly enough, this approach does not make that great a difference in the long run, for Heraclitus' *logos* is not, on any interpretation, just any discourse, and soon becomes by sheer weight of its own contents and meaningful cross-references to other concepts and images, a (if not *the*) fundamental epistemological standard.

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[11] I do not claim exhaustivity here, as there could be a few other fragments coming between B1 and B 114 (B 19 and 34 come to mind). As to the relationship between B 114 and 2, I follow Marcovich and others in treating it as a single, continuous whole. This would require more argument that I can give here, but it is *prima facie* likely, on grounds of style (i. e. narrative, "diegematic" form) and of content affinity (i. e., the ξυνόν), that the texts go together. It is worth noticing that Kahn's insightful ordering does not follow this line, nor does Mouraviev's reconstruction.

[12] B 1: τοῦ δὲ λόγου τοῦδ' ἐόντος αἰεί ἀξύνετοι γίνονται ἄνθρωποι καὶ πρόσθεν ἢ ἀκοῦσαι καὶ ἀκούσαντες τὸ πρῶτον· γινομένων γὰρ πάντων κατὰ τὸν λόγον τόνδε ἀπείροισιν ἐοίκασι, πειρώμενοι καὶ ἐπέων καὶ ἔργων τοιούτων, ὁκοίων ἐγὼ διηγεῦμαι κατὰ φύσιν διαιρέων ἕκαστον καὶ φράζων ὅκως ἔχει. τοὺς δὲ ἄλλους ἀνθρώπους λανθάνει ὁκόσα ἐγερθέντες ποιοῦσιν, ὅκωσπερ ὁκόσα εὔδοντες ἐπιλανθάνονται.

B 114: ξὺν νόῳ λέγοντας ἰσχυρίζεσθαι χρὴ τῷ ξυνῷ πάντων, ὅκωσπερ νόμῳ πόλις, καὶ πολὺ ἰσχυροτέρως. τρέφονται γὰρ πάντες οἱ ἀνθρώπειοι νόμοι ὑπὸ ἑνὸς τοῦ θείου· κρατεῖ γὰρ τοσοῦτον ὁκόσον ἐθέλει καὶ ἐξαρκεῖ πᾶσι καὶ περιγίνεται.

B 2: διὸ δεῖ ἕπεσθαι τῷ <ξυνῷ>, τοῦ λόγου δ' ἐόντος ξυνοῦ ζώουσιν οἱ πολλοὶ ὡς ἰδίαν ἔχοντες φρόνησιν.

Now, without denying that the meaning of *logos* includes Heraclitus' own account or discourse, reducing it to "his Word" (with a capital *w*, as Burnet would have had it) just will not do. It is not necessarily misleading to insist that one must translate *logos* as "discourse" or "account," since it is expressly stated (here and elsewhere) that *logos* is something heard (and not understood) by "most men." But to claim that this is all *logos* means is, again, something else. It seems much more likely that the texts themselves support quite the opposite claim, and that a purely linguistic reading[15] of *logos* will not suffice to satisfy obvious contextual requirements.

The very first sentence is syntactically ambivalent, in a way that permits or even demands that both possible constructions are kept.[16] If "forever" (αἰεί) is construed with the *logos* "being this," or with the "existing

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[13] Starting with Diels, adherents to this general view include W. Jaeger, R. Mondolfo, M. Heidegger, O. Gigon, H. Fränkel, M. Marcovich, C. Eggers, and C. H. Kahn, all in the bibliography below.

[14] Cf., besides Burnet, M. L. West, C. Diano, T. M. Robinson, J. Barnes, and M. Conche, all in the bibliography below.

[15] Such as West's (see above, n. 2, pp. 124 ff.) insistence that *logos* refers "to Heraclitus' discourse and *nothing else*" (my italics).

[16] As one can see, for example, in Kahn's translation: "Although this account holds *forever*, men *ever* fail to comprehend" (97). That the syntax of the first sentence can work both ways (i. e. λόγου τοῦδ' ἐόντος αἰεί or αἰεί ἀξύνετοι γίνονται ἄνθρωποι) is made clear by Aristotle's famous complaint in the *Art of rhetoric* (III, 5, 1407b 11 ff.). See D. Sider, "Word order and sense in Heraclitus: Fragment One and the river fragment," in K. Boudouris (ed.), *Ionian Philosophy* (Athens 1989) 363-368.

(or real) *logos*,"[17] even if we take this to mean merely that "the discourse is always true" (taking the expression in the weaker "veritative" sense, rather than in the fuller and more natural predicative sense, or in the stronger "existential" one), this does not by itself exclude an intended deeper meaning[18]. In fact, the language that Heraclitus uses rather suggests the eternal existence of its objective contents: if he is saying, at the very least, that his own account holds true throughout, this could very well be due to his implicitly attributing irrestricted ontological permanence to its proper object[19] (there could even be an intentional, yet subtle, play between the *logos* "*being* (this) forever" (ὅδε ὁ λόγος ἐὼν αἰεί) and all things *becoming* according to it). Burnet may have been right that *logos* should not be translated as "reason" (as a cognitive faculty), but his interpretation of it as "Word" misses the objective sense, which could be better conveyed by the French expression, *raison d'être. Logos* as objective rationality pertains to the formal aspect of the real, the way things are and happen, the structure in all change. Seen in this light, and without being named, *logos* is mirrored in the eternal *kosmos*, which is an ever-living fire (B 30), kindled and quenched "in measures" (μέτρα). More obliquely perhaps, *logos* is implied in the river statement (B 12), the quintessence of which is identification and opposition of "the same rivers" (ποταμοῖσι τοῖσιν αὐτοῖσιν) and ever different waters (ἕτερα καὶ ἕτερα ὕδατα). The common thought here is permanence in change, sameness in difference, unity in plurality. All these formulae are but variations that approach the same unitary and dynamic objective rationality.

If by *logos* Heraclitus meant *only* his own discourse, how is it, then, that men are expected to understand it "*before* having listened" to it?[20] How could he say, not only that it "is always the same" or that it "exists forever”[21] and that “all things happen” according to it, if he did not mean to point to some kind of objective cosmic principle, a single universal “law,” as suggested in B 114? And would not it be a bit unlikely that, by calling the *logos* “common” (ξυνόν, B 2), Heraclitus intended to express only the universality and the formal unity of his own account, but not the actual complex unity of its subject-matter? Questions like these are perhaps among the reasons why Diels corrected himself translating “Weltgesetz,” “Law of the world” (appending this latter meaning to the much simpler original “Wort”).[22] In a different line, but likely moved by similar reasons, Marcovich translated it as “Truth,” while Kirk proposed “the formula of things.” Kahn, *H.* 22, interprets it as being “at once the discourse of Heraclitus, the nature of language itself, the structure of the *psukhē* and the universal principle in accordance with which all things come to pass.”

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[17] Rather than with ἀξύνετοι γίνονται ἄνθρωποι , although this needs not to be excluded.

[18] Especially since Heraclitus' careful expression mimics one Homeric formula that refers to the blissful existence of the gods, θεοὶ αἰὲν ἐόντες , *Il.* 1.290, 494; 21.518; 24.99; *Od.* 1.263, 378; 2.143; 3.147; 4.583; 5.7; 8.306, etc.

[19] As he does in B30, where *logos* is likely to be implied in the measures, which surely are as eternal as the world-order, the *kosmos* itself. As with φύσις, Heraclitus' usage of κόσμος is the first one attested in the history of philosophical language.

[20] So rightly argued by Kahn, *H.* 98.

Logos must include the generic notion of language, and specifically Heraclitus’ own discoursive account as part of its surface meaning, but it also must refer, as its proper object and the solid ground for true knowledge, to the nature of things themselves, to “being” or “reality” (as the text also suggest: *cf.* the parallel κατὰ τὸν λόγον, κατὰ φύσιν in B 1). It is no mere coincidence that he insists that “φύσις tends to be hidden,”[23] just as *logos* is said here to be, from the wits of most men. Ignorance of the rationale of things themselves, omission of the ontologically basic facts of *logos* and *phusis* lie behind his famous criticisms of venerable poets as Homer (B 42, 56), Hesiod (B 40, 57, 106) and Archilochus (B 42), and representatives of Ionic ἱστορίη as Xenophanes (B 40), Pythagoras (B 40, 129) and Hecataeus (B 40). Hiddenness dialectically refers precisely to what is manifest (φανερόν), and is best interpreted in an “epistemological” context (rather than a purely “ontological” one).

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[21] As it is plain that I take αἰεί with the participle ἐόντος, my reading tends to be a metaphysical one. If the minimalist view is prefered, the phrase would mean simply that the *logos* as discourse “is true” [Burnet], or that it “holds throughout” [West], with no ontological overtones.

[22] Cf. Diels, *Die Fragmente der Vorsokratiker*^{1,2} (Berlin 1903, 1906) 1, ch. 12: “Für dies Wort.” “Alles geschieht nach diesem Wort.” “Weltgesetz” was added in Diels’ second edition of *Herakleitos von Ephesos* (Berlin 1909).

[23] DK 22 B 123: φύσις κρύπτεσθαι φιλεῖ. I owe to Daniel Graham the point that φιλεῖ does not mean here “loves,” but (in view of the infinitive) something like “it is usual for.” See his “Does nature love to hide? Heraclitus B 123 DK,” *CP* 98 (2003) 175–179. Compare with B 87, n. 29 below.

For Heraclitus, *logos* refers to the rational aspect of reality, to "objectivity" (in an ontological as well as in an epistemological sense), and it is thus fair to call it a principle of being. This strong objective sense is reinforced by semantic closeness of *logos* and *metron*, as shown by the expression μετρέεται εἱς τὸν αὐτὸν λόγον, "is measured [*sc.* either "earth" or "sea"] in the same *proportion*," in B 31b (a text in which the surface meaning seems to have pushed the notion of language to a remote background). *Metron* is a key notion in the cosmic order, which is "ever-living fire" (B 30). In fact, and even leaving aside the enlightening analogy with the single divine law in B 114,[24] a high ontological status of *logos* is also backed by B 2, which closes the Proem by calling the ever-real *logos* "common" or "shared" (surely by all things).[25] *Logos* is opposed to most men's fancy, ironically refered to as a "wisdom" of sorts, which is "private" or "peculiar to each" (ἰδίη φρόνησις), an oxymoron which immediately recalls the analogical image of men as oblivious sleepers.[26] So the *logos* in the Proem presents the reader with a characterization of "human life in epistemic terms," as Kahn, *H.* 100 aptly puts it. The background seems more metaphysical (ontological) than cosmological (in a narrow physicalistic sense), and the foreground could be perceived as epistemological and ethical at the same time.

By giving expression to the notion of the rationality of the real,[27] Heraclitus points at once to a vital unity of being and speech, word and content, and includes the ontological structure or "nature" of the contents of language itself within the semantic range of *logos*. Heraclitus' choice of words suggests that remedying men's need for knowledge should begin with a fuller understanding of their own language. To say it again in Kahn's words: "*logos* means not simply language but rational discussion, calculation, and choice: rationality as expressed in speech, in thought and in action" (*H.* 102). *Logos* is simultaneously a metaphysical *and* an anthropological principle. It is not just an accident that, in what looks like a rare praise, Bias of Priene is credited with a "greater" or "better" *logos*—usually translated as "esteem"—than "the rest."[28] Nor is it trivial to state that "for a stupid man it is usual to be amazed at every *logos,*"[29] or, again, that *logoi* heard by Heraclitus are cut off from the wise.[30] Heraclitean explicit usage (in all nine fragments containing the term) reveals an awareness of the tension between speech and wisdom, since not every *logos* is in fact wise. At the same time, intelligent speech is endowed with the power of making *phusis* manifest. Heraclitean utterance is closely shaped after the oracular Delphic model: Apollo, who represents the highest standard, "says not, neither hides, but gives a sign."[31] The twin themes of speaking and hearing give *logos* a concrete texture, and develop into fuller ideas (involving much more than mere perception), rich in epistemic and moral nuances: "They [most men?] know not how to hear, nor to speak" (B 19), and like the deaf, "though present, they are absent" (B 34). Universal

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[24] An analogy clearly refered to and greatly appreciated by Cleanthes (perhaps so much that he not only took it over but considerably enriched it) in his *Hymn to Zeus*. Although analogy of *logos* and *nomos* is particularly visible, it is by no means the only significant point of affinity. It is worth recalling line 21 (ὥσθ' ἕνα γίγνεσθαι πάντων λόγον αἰὲν ἐόντα), which clearly takes on Heraclitus B 1, and supports the reading proposed here. *Logos* was fused with Fire and Zeus in the Stoic tradition from Cleanthes on. On these questions, see A. A. Long, "Heraclitus and Stoicism," in id. (ed), *Stoic Studies* (Berkeley 1996) 35–57.

[25] Note, besides the formula τῷ ξυνῷ πάντων in B 114, the echoes of λόγου τοῦδ' ἐόντος αἰεί (B1), and τοῦ λόγου δ' ἐόντος ξυνοῦ (B 2) in B 80's τὸν πόλεμον ἐόντα ξυνόν.

[26] B 89 connects the sleepers with private worlds of their own. With Marcovich, I fear that Plutarch, the source here, could be freely paraphrasing B 1 and 30.

[27] I submit that the Stoic view on Heraclitus' *logos* is, on the essentials, correct. I believe that A. A. Long has got it right when he writes that "[i]t is thoroughly misleading to label Heraclitus' *logos* "metaphysical" and that of the Stoics *moral*. In both systems *logos* is a principle of being *and* a principle of morality. […] In calling their own active power in the universe *logos* the Stoics were expressing

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the closest affinity with Heraclitus" (above, n. 24) 51. See also Long in this volume.

[28] B 39: ἐν Πριήνῃ Βίας ἐγένετο ὁ Τευτάμεω, οὗ πλέων λόγος ἢ τῶν ἄλλων. It is not at all clear who these "others" specifically are: the citizens of Priene, Greeks generally, perhaps the other six sages? Approval of at least one of Bias' moral *gnōmai* is explicit in B 104, so it seems that, in spite of the usual meaning of the Ionic expression πλέων λόγος (= "higher esteem"), *logos* must include what Bias himself said, and he must have suceeded in showing things as they truly are.

[29] B 87: βλὰξ ἄνθρωπος ἐπὶ παντὶ λόγῳ ἐπτοῆσθαι φιλεῖ. This deals with the receptive aspect of the process of acquiring knowledge, implicitly contrasting hearing with the more creative abilities of speaking and acting.

[30] B 108: ὁκόσων λόγους ἤκουσα, οὐδεὶς ἀφικνεῖται ἐς τοῦτο ὥστε γινώσκειν ὅτι σοφόν ἐστι πάντων κεχωρισμένον. I take πάντων as masculine and referring back to ὁκόσων. The targets would seem to naturally include some great figures named in other fragments, such as Homer, Hesiod, Archilochus, Hecateus, Xenophanes, and Pythagoras.

[31] B 93: ὁ ἄναξ οὗ μαντεῖόν ἐστι τὸ ἐν Δελφοῖς οὔτε λέγει οὔτε κρύπτει ἀλλὰ σημαίνει.

presence of *logos* as a voice men constantly hear is implicitly paired with its absence from their conscious minds: "that with which they deal continuously, this they differ from, and things they encounter every day seem alien to them."[32]

The universal ontological dimension of *logos* becomes clearer still when we look at B 50:

> Having listened, not to me, but to the *logos*, it is wise to say in agreement (ὁμολογεῖν): all things are one[33].

The first point of interest here is the distinction between Heraclitus' own words and the *logos* men should heed. *Logos* is not reducible to speech, not even to that which is spoken of, but suggests a voice and a continous presence, perceived but unrecognized by most men (B 72, 17). We have in B 50 a characterization of the attitude of the intelligent speakers (*legontes*) of B 114, which is opposite to that of the sleepers. Not surprisingly, here we find that (true) wisdom lies in men *speaking* together with one another and *saying* the same thing (ὁμολογεῖν) that *logos* utters once and again, the oneness of all things (ἓν πάντα). A couple of other fragments (B 41, 32) contain the expression ἓν τὸ σοφόν, which joins immediately unity and wisdom[34].

Heraclitus' *logos* is not only a complex rational concept, but a powerful, yet simple image, almost a metaphor. So, instead of choosing between "language" and "the well-ordered nature of the real" as a single basic meaning, necessarily excluding one of the two, I propose we ought to keep both, and interpret Heraclitus' *logos* as the language of the real[35]: the language of objective rationality and the rationality of language. *Logos* appears as a voice[36] coming from the real itself, the voice of meaningful and intelligent language, which coincides with the structural objective single form in things themselves and is mirrored in Heraclitus' own carefully articulated statements.

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[32] B 72: ᾧ μάλιστα διηκενῶς ὁμιλοῦσι (λόγῳ τῷ τὰ ὅλα διοικοῦντι), τούτῳ διαφέρονται, καὶ οἷς καθ' ἡμέραν ἐγκυροῦσι, ταῦτα αὐτοῖς ξένα φαίνεται. Probably not a verbatim quotation in its entirety (it is likely that the words in the parenthesis, as well as the final formula, are at best paraphrases).

[33] B 50: οὐκ ἐμοῦ ἀλλὰ τοῦ λόγου ἀκούσαντας ὁμολογεῖν σοφόν ἐστιν ἓν πάντα εἶναι.

[34] B 41: ἓν τὸ σοφόν· ἐπίστασθαι γνώμην †ὁτέη κυβερνῆσαι† πάντα διὰ πάντων. B 32: ἕν, τὸ σοφὸν μοῦνον, λέγεσθαι οὐκ ἐθέλει καὶ ἐθέλει Ζηνὸς ὄνομα. Both texts seem to allude to *logos*, though in a very elliptical manner: in the first case, through the universality and immanence of the *gnomē*, and through the passive form *legesthai*, which is the object of "wants not and wants," in the second. The theme of unity is itself as intricate as that of *logos*. No fewer than ten fragments refer explicitly to τὸ ἕν: besides those already refered to, cf. B 10 (closely echoing B 50), and B 29, 33, 49, and 121, all of which exploit the political side of the idea of unity. Unity is typically viewed as synthesis in Heraclitus, and is expressed with the term *harmoniē,* used in B 51 and 54. See E. Hülsz Piccone, "La unidad de la filosofía de Heráclito" *Tópicos* 28 (2005) 13–46.

Unity of all things (ἓν πάντα), as B 50 puts it, is a proper characterization of the content of the same *logos* which is called in the Proem forever real and common or shared by all things, and which is itself a unity of opposites. Heraclitean *logos* is, first and foremost, the universal rationale of reality: it is a *permanent*, formal *principle*, a sort of *law* that pertains to reality itself, conceived of and presented as a rational language. The explicit notion of a community of all things through *logos* (and thus of all men, and of all they say and do) refers to the togetherness or integrity of being, in itself and as presented in true language. Communion of intelligent language with the intelligible nature of things is indeed the suggested basis for true knowledge on the level of human action, and the reason why *logos* is a prescriptive, and not merely a descriptive principle: being and action are connected through *logos* as the rational language of the real.

Heraclitus' criticism of men's epistemic negligence is based on his attributing them a universal and natural capacity to understand[37], which is nevertheless seldom achieved: even the senses can be deceptive, but only because the data they provide can be incorrectly interpreted by their souls—which in turn must be seen as seat of the faculty of understanding: "Eyes and ears are bad witnesses," he writes elsewhere, "for men who have barbarian souls."[38] A barbarian soul is, of course, one that does not speak the language of the real, and whose defective discourse or account is, because of its being irrational, thus "separated" from "the wise" (B 108). One important point Heraclitus is making here is that, for good or ill, the human soul is the natural seat for the faculty of apprehending, understanding and expressing the rationality and true nature of things.

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[35] Cf. T. M. Robinson, *Heraclitus. Fragments* (Toronto 1991) and id., "Heraclitus and *logos*–again," in E. Hülsz (ed.), *Nuevos ensayos sobre Heráclito* (Mexico City 2009) 93–102.

[36] Cf. C. Eggers Lan, "La doctrina heraclítea del logos," *Nova Tellus* 5 (1987) 11 ff.

[37] With which he explicitly credits "all men" in B 113, echoed also in B 116. See below nn. 51–52.

[38] B 107: κακοὶ μάρτυρες ἀνθρώποισιν ὀφθαλμοὶ καὶ ὦτα βαρβάρους ψυχὰς ἐχόντων.

Heraclitus on *Logos* and Self: Some "Ethical" Fragments

An essential link between the human[39] soul and *logos* is focused in B 45:

> He who travels every path would not find the boundaries of soul, [as he goes]: so deep a *logos* does it have.[40]

Immediate connection between the soul and *logos* is apparent, a point that strenghthens that rationality (and not just language) comes into play here. Many interpreters have been baffled by the curious paradox about the soul's limits and its suggested virtual unlimitedness or immensity: if Heraclitus is saying that the soul is limited, then why is it that its boundaries could not be reached? And if he is saying that soul is, in some sense, infinite, how are we to understand the positive reference to its πείρατα? Puzzlement is probably induced, not just by Heraclitus' unmistakable paradoxical style, but also by the reader's (understandable) eagerness to find a sort of definition of the soul's nature. But Heraclitus is perhaps not concerned here (is he ever?) with solving the definitional *aporiai* that might trouble his readers or hearers, but with making a point about the presence of *logos* (again best interpreted as a rational principle), precisely *within* the soul of man. He is succeeding to set down, in a short string of words, the limits of the soul's cognitive power. The soul's nature is not exhausted here, but is displayed in a set of other fragments. In particular, B 36[41] implies the soul's mortality, and a primarily (though perhaps not exclusively) cosmological context seems likely there. Although I will not go into the matter, the allegedly Heraclitean doctrine of the soul as fire does not seem to be backed by the fragments themselves (and it would be hardly useful anyway for gaining new insight into the meaning of B 45). The connection with selfhood seems more promising.

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[39] Among the possible hermeneutic scenarios, I favor an anthropological one, which seems the most likely. This line of interpretation is compatible with more cosmological and physicalistic approaches of Heraclitus' views on the soul.

[40] B 45: ψυχῆς πείρατα [ἰὼν] οὐκ ἂν ἐξεύροι, ὁ πᾶσαν ἐπιπορευόμενος ὁδὸν· οὕτω βαθὺν λόγον ἔχει. I assume the alternative reading to Diogenes Laertius' text, proposed by Gábor Betegh in "The limits of the soul: Heraclitus B 45 DK. Its text and interpretation", in E. Hülsz (ed.), *Nuevos ensayos sobre Heráclito* (Mexico City 2009), 391–414. For yet another reading see J. Mansfeld, "Heraclitus Fr. 22 B 45 D.– K. A Conjecture," *Elenchos* 31 (2010) 117–122, who, relying on B 18, proposes οὐκ ἐξευρήσει instead of οὐκ ἂν ἐξεύροιο.

[41] B 36: ψυχῇσιν θάνατος ὕδωρ γενέσθαι, ὕδατι δὲ θάνατος γῆν γενέσθαι· ἐκ γῆς δὲ ὕδωρ γίνεται, ἐξ ὕδατος δὲ ψυχή. ("For souls it is death to become water, for

The background image seems to be an alternative description of the personal experience Heraclitus alludes to in B 101: "I went in search for myself"[42]. If identity of soul and self is assumed,[43] this would then be a journey one takes within one's soul. The whole territory to be traversed must be soul itself, and the imaging of the road and the unsuccessful search seems to unfold at first in a spatial, horizontal dimension. As the traveller surely must be the owner of a soul, the drift is that the journey within oneself is a cognitive reflexive experience, not to be ascribed to just any soul,[44] but to the intelligent one. Now, the point of this horizontal approach is that the limits are *not* to be found. Is there a moral lesson in here? If some prescriptive intention is present, it cannot be *not* to search, but quite the contrary. Comparison with other thematically akin texts on searching, as for instance B 18 ("He who does not expect, will not find the unexpected, for it is hard to find and to understand"[45]) and B 22 ("Those who search for gold dig much earth and find little"),[46] suggest that Heraclitus' point is the difficulty, not the radical impossibility, of the soul's cognition. The ethical impact of the cogni-

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water it is death to become earth. But water is born from earth, and from water, soul.")

[42] B 101: ἐδιζησάμην ἐμεωυτόν. This was sometimes interpreted in antiquity (e. g., Diogenes Laertius 10.5) as meaning that Heraclitus was self-taught. But more could be going on here: the traditional idea of self-knowledge is essentially linked to *sophrosune*, which is precisely the virtue praised in B 112. The sentence also mimics the delphic γνῶθι σαυτόν. To know oneself is, of course, not just psychological self-awareness, but requires being able to understand what one is and is not, and so to know one's proper place. See Julia Annas' exploration of Heraclitean self-knowledge in *Alcibiades I*, *Lovers,* and *Charmides:* "Self-knowledge in Early Plato," in D. O'Meara (ed.), *Platonic Investigations* (Washington 1985) 111–138.

[43] A point denied by Marcovich, *H.* 57.: "[…] neither δίζησθαι means the same as γινώσκειν, nor ἐμεωυτόν as ψυχή."

[44] The restrictive character of the interpretation was suggested to me by Conche's text. Contrast with B 116, which I take to refer to self-knowledge as a universal faculty, not a universal accomplishment.

[45] B 18: ἐὰν μὴ ἔλπηται ἀνέλπιστον οὐκ ἐξευρήσει, ἀνεξερεύνητον ἐὸν καὶ ἄπορον.

[46] B 22: χρυσὸν γὰρ οἱ διζήμμενοι γῆν πολλὴν ὀρύσσουσι καὶ εὑρίσκουσιν ὀλίγον.

tive search gains in clarity if the soul is to be thought of at once as the object being searched for, as well as the active searching subject.

The final point changes the reader's perspective once more: limits are out of reach, and at the same time, are determined precisely as such, *because of* "the deep *logos*" that the soul "has." Depth of *logos* suggests a "vertical"[47] dimension: and even if limits are, for every person, impossible to reach, *logos* must be at the beginning and at the end (B 103)[48] of every path one can take, whatever its direction (B 60: ἄνω κάτω, "up and down"),[49] just as it must be both within and without.[50] So the upshot of all this is that ψυχή, in spite of its limitedness, can in principle come to know of all things by virtue of the *logos* within (for *logos* is, as already we have seen, universal or common to all things—soul itself included). This line of interpretation is consistent with what we find in other relevant fragments, which together put ψυχή in an intensely anthropological scenario. It will be noticed that the picture I am presenting amounts to a basically optimistic view, both ethically and epistemologically, to which someone could object that it seems to flatly contradict Heraclitus' repeated condemnation of men's epistemic negligence. But this incoherence is merely apparent, and not real. For it is not all men, not always, and not fatally, who are so vigorously critized by Heraclitus (but merely "most men"). When he explicitly refers to "all men," what he actually says is "thinking is common to all"[51] and "all men partake in knowing themselves and being of a sound mind"[52].

Now, from the viewpoint of this interpretive sketch of B 45, B 115 makes perfect sense:

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[47] I take the suggestion of focusing on the image of B 45 through a double viewpoint, consisting in a horizontal axis and a vertical one, mutually complementary, from Marcovich's commentary *ad loc* in *H.*

[48] B 103: ξυνὸν γὰρ ἀρχὴ καὶ πέρας ἐπὶ κύκλου.

[49] B 60: ὁδὸς ἄνω κάτω μία καὶ ὡυτή.

[50] For other suggestive interpretations of B 45, see A. Lebedev, "*Psychēs peirata* (Il termine *psychē* nei frammenti cosmologici di Eraclito 66–67 M" (17–26), M. Ghidini Tortorelli, "Limite e circolarità in Eraclito: frr. 45 e 103 D.-K." (27–46), and P. Rosati, "Eraclito, in 'cammino,' Intorno al fr. 60 D.-K." (47–62), all in M. Capasso, F. De Martino, P. Rosati (eds.), *Studi di filosofia preplatonica* (Naples 1985).

[51] B 113: ξυνόν ἐστι πᾶσι τὸ φρονεῖν.

[52] B 116: ἀνθρώποισι πᾶσι μέτεστι γινώσκειν ἑαυτοὺς καὶ σωφρονεῖν.

> To the soul belongs a *logos* which increases itself.[53]

The limits of soul are out of reach, for they are unstable and changing. And how could it be otherwise, since the *logos* on which they depend is said to grow by itself? The metaphor of growth (affecting both *logos* and soul) must stand for the progress of an intelligent soul's self-knowledge but, at the same time, also for the soul's ontological structure, its distinctive nature, or φύσις. Marcovich's *philosophical* objection to the authenticity of B 115—that the notion of a changing measure is implausible in Heraclitus—is not convincing: although it is true that Heraclitus' theory implies that measure is something *constant*, it is a bit too much to reduce it to a "numerical ratio."[54] And, besides that, would it not be an argument in favour of authenticity that the bold idea of a permanent standard of change that constantly changes by itself (ἑαυτὸν αὔξων) is the supreme paradox? It is tempting to connect the *logos* that increases itself of B 115 with the sentence in B 84a, which lacks an explicit grammatical subject: "it rests by changing."[55]

Thus, both B 45 and 115 would point to the specific presence of *logos* in the anthropological dimension: all things change according to *logos*, but natural (non-human) change, although analogous to human becoming, would not, after all, be identical with it. To derive again from the originary examples, Heraclitus says that Ἥλιος, the Sun—itself an important paradigm for the rationality of change, by its being fiery and "always new" (B 6[56])—"will not overstep his measures."[57]

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[53] B 115: ψυχῆς ἐστι λόγος ἑαυτὸν αὔξων. I cannot make the case for the authenticity of B 115 fully here. It may be summarily laid down, however, that the *onus probandi* falls rather on the side of those who deny it is genuine (the source here is Stobaeus, who also provides the whole series B 108-B 119). Explicit attribution to Socrates (by some unattentive scribe) is not an unsurmountable objection.

[54] I set this apart from his other two objections, which are of a different nature. Cf. Marcovich, *H.* 569 ff.

[55] B 84a: μεταβάλλον ἀναπαύεται, the first part of the only DK fragment transmitted by Plotinus.

[56] I must say that I assume a different reading of B 6, one of the "solar" fragments. I propose that what Heraclitus wrote includes the expression "always new" (ὁ ἥλιος οὐ μόνον καθάπερ Ἡράκλειτός φησιν, νέος ἐφ' ἡμέρῃ ἐστίν, ἀλλ' ἀεὶ νέος). If one could follow A. García Calvo's suggestion (above, n. 1), perhaps the addition of [καὶ ὡυτός] would be a fitting end. The result would be something like this: "the Sun (so Heraclitus says) is not only new every day, but new always [and the same]." On my view, Heraclitus could be criticizing a theory (if theory it could be called) attributed independently to Xenophanes, a known target in

Human conduct, on the other hand, is nothing like this: by his very nature, man is constantly overstepping *his* measures: Ὕβρις is a recurring fact everywhere in human life, either in a political context, as "wanton violence,"[58] or in the individual's everyday existence (as in the drunkard with a wet soul in B 117[59]). Human unreasonableness has a place in the cosmic order of Heraclitus.

But again, so does the possibility of true excellence, even if this will be restricted to a few, the true ἄριστοι.[60] In my view, Heraclitus is an ethical optimist at heart, his harsh criticism of his fellow citizens[61] and his well-known unflattering views on men in general notwithstanding. For, all things considered, those who speak with intelligence, the owners of non-barbarian souls with ever-changing limits are there too, side by side the unintelligent hearers. And perhaps even they can change, and learn to think well, see, hear, speak and act. B 112 wraps it up neatly:

> Being of a sound mind is the greatest merit and wisdom: to say what is true and to act according to nature, as those who pay heed.[62]

Supreme virtue and wisdom are equated with sound thinking, which consists of the unity of speech and action. As in B 1, the adverbial phrase κατὰ φύσιν is in *apo koinou* construction, and can be taken as modifying the three surrounding verbs (λέγειν, ποιεῖν and the participle ἐπαΐοντας), strongly evoking the language of the proem. Heraclitus' moral ideal is thus quite philosophical, and it could be fairly characterized as an ethical intellectualistic theory: moral virtue is deeply rooted in knowledge and the nature of things themselves, including men. One important feature of this ideal is that it seems feasible, reasonable and earthly, as is befitting

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another authentic fragment (B 40). See my "Heraclitus on the sun," in R. Patterson, V. Karasmanis, and A. Hermann (eds.), *Presocratics and Plato. A Festschrift in honor of Charles H. Kahn* (Las Vegas 2012) 31–52.

[57] B 94: Ἥλιος γὰρ οὐχ ὑπερβήσεται μέτρα.

[58] B 43, tr. after Kahn.

[59] B 117: ἀνὴρ ὁκόταν μεθυσθῇ, ἄγεται ὑπὸ παιδὸς ἀνήβου σφαλλόμενος, οὐκ ἐπαΐων ὅκη βαίνει, ὑγρὴν τὴν ψυχὴν ἔχων.

[60] That is, not the so-called "best" in B 29, but "the best" in terms of their wisdom, not their birth, the bearers of σωφρονεῖν, "being of a sound mind," itself identified as supreme merit (ἀρετή) and wisdom (σοφίη) in B 112.

[61] B 121, and implicitly, many others of which the clearest are B 29, 49 and 104. For a different reading of οἱ δὲ πολλοὶ in the second clause of B 29, see Sider in this volume.

[62] B 112: σωφρονεῖν ἀρετὴ μεγίστη καὶ σοφίη· ἀληθέα λέγειν καὶ ποιεῖν κατὰ φύσιν ἐπαΐοντας.

to the author of the famous saying: "Man's character is his fate" (B 119)[63]. So, in symmetric contrast with the wet soul of the drunkard, temporarily devoid of the most elementary functions (such as being able to walk or just to stand up and having a sense of direction), Heraclitus points us to the virtues of just being sensible. In Heraclitus' universe there's also room, somewhere, for a dry soul (one endowed with a divine *ēthos*, B 78[64]). This is the best, as it is the wisest. But Heraclitus does not stop there. He also calls this, the best and wise soul, "a beam of light."[65]

This last and very visual image might be somehow connected with the auditive image of *logos* through B 16:

> How could someone be unaware of that which never sets?[66]

Since this question illustrates so well the nature of *logos* itself, I suggest that it complements Heraclitus' implicit imperative (I mean something like ἄκουε λόγου, "listen to *logos*"[67]). "Do not"—he seems here to tell us—"turn a blind eye to that which is always present." His intended point is here that we picture something like a hypersun that never sets, a source of light that never fails. And what, better than *logos*, could claim to be the ultimate foundation for intelligibility and enlightenment? The philosophical unity of Heraclitus' *logos* presents, in addition to its diverse meanings, which we already touched upon earlier, an ethical (and perhaps also a political) dimension. And, inasmuch as *logos* includes the idea of measure and the rational and unifying relationship between things, it operates also as a sort of poetic principle. All this has to do with the internal physiology of being, thought, language and action in Heraclitus' complex metaphysics. Not only is *logos* a fundamental metaphysical concept, but it is at the centre of Heraclitus' view of man as an ethical—and a political—being.

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[63] B 119: ἦθος ἀνθρώπῳ δαίμων. I read into this Heraclitus' recognition of moral autonomy and resposibility of the individual.

[64] B 78: ἦθος γὰρ ἀνθρώπειον μὲν οὐκ ἔχει γνώμας, θεῖον δὲ ἔχει. This I take as a good example of *diairesis kata phusin*, which focuses on internal opposition within (human) *ēthos*.

[65] B 118: αὐγὴ ξηρὴ ψυχὴ σοφωτάτη καὶ ἀρίστη The basic meaning of αὐγή is "light of the sun" (LSJ *s. v.*). It could perhaps mean here just "a bright light." I follow Kahn in keeping Stobaeus' text. In all fairness, it should be said that there are alternative readings to that proposed here. Another possibility would be "A dry gleam of light is the wisest and best soul," but then what might "a dry gleam of light" mean?

[66] B 16: τὸ μὴ δῦνόν ποτε πῶς ἄν τις λάθοι; The sentence goes well with B 17: οὐ γὰρ φρονέουσι τοιαῦτα πολλοί, ὁκόσοι ἐγκυρεῦσιν, οὐδὲ μαθόντες γινώσκουσιν, ἑωυτοῖσι δὲ δοκέουσι. ("For many men does not think straight about such things as they come across, nor do they know after having learned them, but fancy themselves they do").

[67] This "implicit imperative" I've modelled after Hesiod's formula ἄκουε δίκης, "heed justice" (*Erga* 213, cf. 275 ἐπάκουε δίκης).

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11. Once More unto the Stream

Daniel W. Graham

There is a debate that has been going on for the better part of a century now, as to what Heraclitus' utterances about the river are, and what they mean. The traditional view accepts Diels' fragments 12, 49a, and 91 as different statements about the river, that in general support the view of Plato, Aristotle, and the ancient tradition that for Heraclitus all things are in flux like a river, and nothing remains constant. But in 1916 in a book on Parmenides, Karl Reinhardt argued that a close look at B 12 showed that Heraclitus' point was quite different: instead of stressing the transience of things, he was arguing the constancy of change.[1] With variations, his view has been followed by a number of leading scholars, including Geoffrey Kirk and Miroslav Marcovich, both of whom accept only B 12 as a genuine statement of Heraclitus.[2] Other scholars, however, have continued to accept one or both of the other alleged fragments and to defend a radical flux reading.[3]

As ever, the debate comes down to this: can one, on Heraclitus' view, step twice into the same river? The traditional interpretation says no, the revisionary interpretations says yes. Recently, Leonardo Tarán has criticized the revisionary view of Reinhardt, Kirk, and Marcovich, and put forward a new reading of the evidence, broadly exonerating the traditional interpretation.[4] To my knowledge, this is the only strong defense of the traditional reading to be published in the last twenty years. I have elsewhere defended the revisionary interpretation or something like it,[5] and I here wish to provide a reply to Tarán's article, which, though admirably clear and forceful, seems to me to create more problems than it solves. In my argument I shall (I) present Tarán's argument, (II) raise challenges for it, (III) interpret B 12, and (IV) show how on this interpretation Heraclitus has a coherent and defensible theory of flux. In addressing this problem I am conscious of stepping into a stream of ever-changing waters, but I believe there are some landmarks that will get us safe across.

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[1] K. Reinhardt, *Parmenides und die Geschichte der Griechischen Philosophie* (Bonn 1916) 206–207 *et passim.*

[2] G. S. Kirk, "Natural change in Heraclitus," *Mind* 60 (1951) 35–42; Kirk, *H.* 367–380; Marcovich, *H.* 194–214. Cf. also A. Rivier, *Un emploi archaïque de l'analogie chez Héraclite et Thucydide* (Lausanne1952) 10. Kirk also accepts B 91 (b), but not the problematic B 91(a), which will be discussed below.

[3] G. Vlastos, "On Heraclitus," *AJP* 76 (1955) 337–78; R. Mondolfo, "I frammenti de fiume e il flusso universale in Eraclito," *Revista Critica di Storia della Filosofia* 15 (1960) 3–13; K. Popper, "Kirk on Heraclitus, and on fire as the cause of balance." *Mind* 72 (1963) 386–92; Guthrie *HGP* 1, ch. 7; M. C. Stokes, *One and Many in Presocratic Philosophy* (Washington, D.C. 1971), ch. 4; J. Bollack and H. Wismann, *Héraclite: ou la séparation*, Paris 1972; C. J. Emlyn-Jones, "Heraclitus and the unity of opposites," *Phronesis* 21 (1976) 89–114; J. Barnes, *The Presocratic Philosophers* (London 1982), ch. 4; M. Conche, *Héraclite: fragments* (Paris 1986) 459. T. M. Robinson, *Heraclitus*, Toronto 1987, accepts B 49a but is skeptical about B 91(a). For a good statement of the revisionary view, see A. Petit, "Héraclite: La captation de la marge," *Études Philosophiques* (1988) 207–19.

I

Here are some of the more important statements and reports about the river:[6]

> **T1** [B 12] ποταμοῖσι τοῖσιν αὐτοῖσιν ἐμβαίνουσιν ἕτερα καὶ ἕτερα ὕδατα ἐπιρρεῖ.
>
> On those stepping into rivers staying the same other and other waters flow. (Eusebius, *Praeparatio Evangelica* 15.20; Arius Didymus fr. 39.2)
>
> **T2** [A 6] Heraclitus, I believe, says that all things pass and nothing stays, and comparing existing things to the flow of a river, he says you could not step twice into the same river [δὶς ἒς τὸν αὐτὸν ποταμὸν οὐκ ἂν ἐμβαίης] (Plato *Cratylus* 402a)
>
> **T3** According to Homer, Heraclitus, and all their tribe, all things are in motion like streams. (Plato *Theaetetus* 160d)
>
> **T4** [Cratylus] finally decided that he could not express any thought in speech but only wiggled his finger; and he criticized Heraclitus for saying

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[4] L. Tarán, "Heraclitus: The River-fragments and their implications," *Elenchos* 20 (1999) 9–52. Repr. in id. *Collected Papers (1962–1999)* (Leiden 2001) 126–167.

[5] Cf. D. W. Graham, "Heraclitus' criticism of Ionian philosophy," *OSAP* 15 (1997) 1–50, where, although I argue for a third position, my position is closer to the revisionary view; see Graham, *Explaining the Cosmos: The Ionian Tradition of Scientific Philosophy* (Princeton 2006), ch. 5.

[6] My own translations throughout, except as otherwise noted.

> that it is not possible to step twice into the same river. For *he* thought it was not possible to step in even once! (Aristotle *Metaphysics* 1010a12–15)
>
> **T5** [B 49a] ποταμοῖς τοῖς αὐτοῖς ἐμβαίνομέν τε καὶ οὐκ ἐμβαίνομεν, εἶμέν τε καὶ οὐκ εἶμεν.
>
> Into the same rivers we step and do not step, we are and are not. (Heraclitus Homericus *Homeric Questions* 24)
>
> **T6** [B 91] (a) It is not possible to step twice into the same river [ποταμῷ γὰρ οὐκ ἔστιν ἐμβῆναι δὶς τῷ αὐτῷ] according to Heraclitus, or to come into contact twice with a mortal being in the same state. But by its swiftness and speed of change (b) it scatters things and in turn gathers them–or rather, not in turn or later, but at the same time it comes together and separates–approaches and departs. (Plutarch *On the E at Delphi* 392b)
>
> **T7** ποταμοῖς γὰρ δὶς τοῖς αὐτοῖς οὐκ ἂν ἐμβαίης, ὥς φησιν Ἡράκλειτος, ἕτερα γὰρ ἐπιρρεῖ ὕδατα.
>
> Into the same rivers you could not step twice, as Heraclitus says, for other waters flow on. (Plutarch *Natural Questions* 912a)

According to Tarán, B 49a (**T5**) is not a real fragment of Heraclitus, but only a doublet of B 12 (**T1**), which restates in more everyday language what B 12 is saying more profoundly but obscurely (42–3). Tarán also rejects B 91(b) as alien to Heraclitus' message, but accepts B91(a) (**T6**) as a genuine fragment, which lies behind statements such as **T2, 4,** and **7**, and has a very different message from B 12 by virtue of adding the word 'twice'.[7]

Tarán points out that if we take B 91(a) seriously, Heraclitus is not saying without restriction that "all things pass" (A 6) or "all things flow,"[8] because we can step into the river once at least; hence Heraclitus defends a kind of measured flux rather than a complete flux (14).[9] Furthermore, Plato is stretching his view for his own dialectical purposes (14–16). Something like B 91(a) has the authority of Plato, Aristotle, and Cratylus behind it. But with its use of "twice" and its reference to the river in the singular rather than the plural, it is highly unlikely that B 91(a) could be derived from B 12 (16–19).

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[7] Others, such as Kahn, *H.* 168–169 also accept B 91(a), and see n. 3 above. Some of my arguments will apply to all who defend the alleged fragment.

[8] A. Lebedev, "The Cosmos as a stadium: Agonistic metaphors in Heraclitus," *Phronesis* 30 (1985) 143–145, warns against conflating imagery of running and flowing; but there seems to be some conflation here already.

[9] As Plato *Tht.* 152d-e seems to suggest; in its most extreme interpretation, 182d-183a.

As to B 12, Tarán convincingly shows that in its context, deriving from Cleanthes, it has been misapplied as a metaphor for the birth of souls (21–8).[10] He criticizes Reinhardt and Kirk's readings of B 12, according to which it belongs to a cosmological context, as being unsubstantiated (30). Most interpreters of B 12, Tarán argues, have failed to explain why *potamos* is in the plural; any adequate interpretation should explain this (33). The participle *embainousin* is in the dative as expressing the judgment of those entering the river, and the waters are different from their point of view:

> though in a sense two (or more) people are in the same river, the river water in which each is, is different. … The cosmos is common and one to all men who are really awake … but most people, like sleepers, treat their own environments each as a separate and private cosmos… . [I]n the continuous flow of the different and different waters that bathe them, men find confirmation of their belief that each one lives in his own private universe. (35–6)

On this interpretation, "B 12 is concerned with the common misapprehension that it is possible for men to live in their own private universes" (52), while B 91(a) is about the universal change of individual things, but it is not so radical as the view Plato ascribes to him (50–1).

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[10] Arius Didymus commenting on Cleanthes preserves B 12 (from Eusebius *Praeparatio Evangelica* 15.20.2–3 = Arius Did. fr. 39.2–3 Diels), followed by the sentence, "And souls are nourished by moist exhalations," which some editors have read as a continuation and specification of B 12 (see e. g., L. Gemelli Marciano, *Die Vorsokratiker*, (Düsseldorf 2007) 1:318. Serge Mouraviev defends this reading in his "Héraclite: les fragments du fleuve: B12: le contexte: T 261," *Rev. Philos. Anc.* 26 (2008) 4–39, and *H.* II.A.1, T 261. He provides a valuable reading of the context, but I am not persuaded that it establishes the second sentence for a number of reasons, including the word ἀναθυμιῶνται, whose use is not attested before Aristotle, and clashes with the non-technical language of Heraclitus (on the absence of technical terminology, see L. Gianvittorio, *Il discorso di Eraclito: un modello semantico e cosmologico nel passaggio dall' oralità alla scrittura* (Hildesheim 2010) 59–68. On the context of B 12, see Dilcher, *H.* 177–183. See now M. Colvin, "Heraclitus and material flux in Stoic psychology," *OSAP* 28 (2005) 257–72, who argues persuasively that one of the Stoic commentators pairs Heraclitus' passage with a quotation or paraphrase from Zeno of Citium to establish his Stoicizing interpretation.

II

Tarán's account of the river fragments is a novel and interesting one. It identifies two different river fragments, which belong to different contexts and have different messages, and it develops a complete new interpretation of B 12 while giving a traditional interpretation of B91(a).

The most innovative component of Tarán's interpretation is his reading of B 12. The essence of his interpretation is the claim (quoted above) that "in the continuous flow of the different and different waters that bathe them, men find confirmation of *their* belief that each one lives in his own private universe" (36). Now Heraclitus does indeed claim that the many live their lives like sleep-walkers, each in a private world:

> Other men are unaware of what they do when they are awake just as they are forgetful of what they do when they are asleep. (B 1, in part)
>
> Although this Logos is common, the many live as if they had a private understanding. (B 2, in part)

What is strange about Tarán's reading is the curious juxtaposition by which what Heraclitus says of the many, he takes to be what *they* say about *themselves*. Heraclitus nowhere says the many view themselves that way, and it is difficult to imagine that this could be his point. For surely if the many had reached this Socratic level of self-awareness, they would already be open to Heraclitus' message. Indeed, Heraclitus almost expressly contradicts Tarán's interpretation:

> Many do not understand such things as they encounter, nor do they learn by their experience, but they think they do. (B 17)[11]

Heraclitus' point must not be that the many *believe* they live in private worlds and are ignorant of the world around them–like Cartesian subjects–any more than sleep-walkers believe they are sleep-walking. It is that they live like dreamers when they claim to be fully awake. The many would maintain that they are fully aware of the world about them, even while they make unreliable and subjective judgments about it. Heraclitus never seems to take the beliefs of the many seriously enough to examine for what reasons they believe what they believe; he simply points out that they are unaware of the objective realities around them. It seems highly unlikely that he is engaged in some kind of meta-critique of their beliefs and their grounds for those beliefs. Furthermore, it seems anachronistic to expect that people living around 500 BC would concerned about issues of existential subjectivity, not to mention that Heraclitus would think they were.

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[11] Cf. B 34.

Furthermore, Tarán faults other interpreters of B 12 for not taking seriously the question of why "river" is in the plural. Yet when he gives his own interpretation, he says the following:

> The primary plural is *embainousin*, while the plural "rivers" may be due either to Heraclitus' desire to emphasize the universality of the river-statement in B12, or to euphonic reasons and word-play, or to both … . (35)

After all the fuss about the plural forms, this seems a rather feeble reason for discussing rivers in the plural. Almost any other interpreter could avail himself of the same reasons, and many have.[12] There is no important sense in which Tarán's interpretation makes any special use of the plural form, nor does he have more to say about euphony and word-play, which are central and indeed indispensable to other interpretations. What we are left with is just a generalizing force, which any interpreter who sees the fragment as having a general application, could equally appeal to.

There are, however, serious problems for the traditional interpretation of B 91 too. For this text seems say that all things are changing so much that one cannot encounter the same physical object (e.g. river) twice. The implication that everything is constantly changing would seem to entail, as Plato was quick to point out, that we cannot even use words with constant meaning, or if we can, we cannot describe the world without contradicting ourselves.[13] Tarán acknowledges this challenge before he fully explains his own position:

> If carried to an extreme—as by Cratylus and others—his doctrine would amount to a denial of the law of contradiction. But in all probability he [Heraclitus] himself did not carry his doctrine of the universality of change to that extreme. (11)

Presumably the extreme Tarán refers to is the claim that all things are changing all of the time.[14] But if change is universal, how could Heraclitus not mean that? Even if he were not aware of the implications of his theory, he would be guilty of propounding a theory that transgresses the law of non-contradiction. Now admittedly, there are others who would agree that Heraclitus ignorantly falls into the trap of defending a theory that entails contradictions.[15] But however popular, and ancient, this interpretation may be, it cannot provide a charitable reading of Heraclitus, inasmuch as self-contradiction is the ultimate philosophical failure.

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[12] E.g., Kahn *H.* 167.

[13] See previous note, as well as Pl. *Timaeus* 49c-e.

[14] Barnes (above, n. 3) 65–69 worries about this issue and determines that for Heraclitus "everything is always flowing in *some* respects" (69, Barnes' italics).

Tarán makes one qualification to the traditional interpretation of B 91(a). What kinds of things, he asks, are always changing according to Heraclitus? Heraclitus must only be thinking of individual things, he answers, not abstract qualities such as Plato sometimes has in mind (49–50). But given that restriction, change for Heraclitus was as universal as he could imagine, and the river provided a kind of paradigm example of constant change (50–1). Yet even on this more restricted interpretation, a contradiction arises within Heraclitus' philosophy. For whereas B 91 says that a person cannot step twice into the same river, B 12 says that a person who steps into the *same* rivers encounters ever different waters; but the latter statement surely presupposes or entails that the rivers are the same. Thus, on Tarán's view, B 91 and 12 turn out to be incompatible statements. Curiously, Tarán recognizes this problem early in his presentation:

> [Heraclitus] probably did not realize that, if both the object and the subject are constantly changing, it would not make sense to say "upon those who step into the same rivers different and different waters flow"; one could do so only if one assumes a stable element not only in the rivers but also in those who step into them. (11)

Here one awaits some sort of explication that will show how Heraclitus is not abysmally stupid; but in vain, as Tarán simply moves on to another topic. Since, by Tarán's own account, Heraclitus' theory of change has a universal application, it must apply even to the benighted waders slogging through the river. But according to B 12 the rivers are the same, and the waders encounter them as such. Not only does B 91 by itself entail contradiction, but B 91 is incompatible with B 12.

Finally, Tarán's defense of B 91(a) (= **T6**) as an independent text seems problematic. In considering Plutarch's rendering in **T7**, he says "Plutarch has conflated B 91 and 12" (45), and tries to explain the conflation from the context. But his only real evidence that there is a conflation is the difference in language between B 91(a) and **T7.** Now here I would like to suggest that we look at **T7** without assuming that B 91(a)

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[15] E.g., Barnes (above, n. 3) 79–81.

is a fragment—without, that is, begging the question. **T7** is just B 12 with B 91(a) substituting for the first half of the statement. Notice how close it is to B 12:

T1 = B 12	**T7**	**T6** = B 91(a)
ποταμοῖσι τοῖς αὐτοῖσιν ἐμβαίνουσιν ἕτερα καὶ ἕτερα ὕδατα ἐπιρρεῖ.	ποταμοῖς γὰρ δὶς τοῖς αὐτοῖς οὐκ ἂν ἐμβαίης, (ὥς φησιν Ἡράκλειτος), ἕτερα γὰρ ἐπιρρεῖ ὕδατα.	ποταμῷ γὰρ οὐκ ἔστιν ἐμβῆναι δὶς τῷ αὐτῷ.

In every case the word for river(s) comes first (not the natural word order in Greek any more than English). In **T7**, if we leave out the inferential particle *gar* and the *dis* of the interpretation (cf. Plato in **T2**)[16] we have the same three first words as in B 12 (with Attic rather than Ionic endings),[17] then the same fourth word, though in a finite form rather than a participle; then the same fifth word and (skipping Heraclitus' duplication and Plutarch's inferential particle) the same last two words. The most natural supposition here is that in **T7** Plutarch is substituting what he regards as an equivalent expression for the original **T1.** If that is so, then he regards B 91(a) as just a stand-in for the first half of B 12, not an independent and different statement.[18] Since Plutarch knows Heraclitus' writings well, and is in a position, as we are not, to judge whether there are two river fragments or only one, this substitution offers powerful confirmation for the view that B 91(a) is just a paraphrase of B 12.[19] We could, of course, wonder whether Plutarch had misread B 91(a) or overlooked its context (whatever that might have been). T6 shows parallels also, though here 'river' is rendered in the singular. But now Plutarch's testimony works against Tarán's reading and undermines his claim that there are two independent statements with different contexts. For lacking direct access to Heraclitus' original manuscript, Plutarch is the best witness we have for the relation of the two alleged fragments. He gives a close paraphrase in **T7** and a loose paraphrase in **T6**; but **T7** just is **T1** with some inferential particles

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[16] K. Reinhardt, "Heraklits Lehre vom Feuer," *Hermes* 77 (1942) 60 n. 24, argues out that the *dis* goes back to Cratylus, not Heraclitus.

[17] See C. D. Buck, *The Greek Dialects* (Chicago 1955) 88.

[18] Cf. Reinhardt (above, n. 1) 207n. 1.

[19] Cf. Reinhardt (above, n. 1) 18 n. 24.

(of the kind Heraclitus eschews in order to produce meaningful ambiguities) and some interpretation.

There is, however, one significant difference between Plutarch's paraphrase in **T7** and **T1**, and that is the presence of οὐκ. Yet we cannot reasonably claim that this word has dropped out of **T1**, where it would make no sense. It surely comes from a prior interpretation as manifested already in Plato's **T2**, and has become so ingrained that it has reversed the meaning of the real statement of Heraclitus, namely that in **T1** = B 12.

All in all, there are serious problems for Tarán's interpretation of the river fragments. B 12 (as interpreted by Tarán) says something at odds with Heraclitus' view of human understanding; the alleged fragment B 91(a) by itself entails a contradiction; B 12 and 91(a) are incompatible; and Plutarch treats B 91(a) as interchangeable with B 12.

III

The simplest hypothesis concerning the river fragments is, I believe, that there is only one, B 12, of which B 91(a), no less than B 49a, is a paraphrase. But there is one thing wanting for a convincing case, namely that we be able to show for B 91(a), as Tarán has for B49a, how an intelligent reader could misconstrue it so badly as to turn it into a statement that you cannot step twice into the same river. Against the assumption that there are plural river fragments, I hope I have shown that the alleged fragments other than B 12 are *too much* like B 12, as well as too contradictory of it.

Can we, then, reconstruct a plausible account of how B 12 might have come to be read as B 91(a) and A 6? Marcovich rightly argues that Cratylus and those who read B 12 as he does must take *embainousin* as iterative in force: every time someone steps into the river, different waters flow.[20] Cratylus must also have focused on *hetera kai hetera* to the exclusion of *toisin autoisin*. Then he can claim that each initial step into the river is a step into different waters. This would be an interesting interpretation, but a hasty one. For since Heraclitus expressly states that the rivers are the same, it really does not matter for the identity of the rivers that the waters are different. Nor, in fact, does it matter whether we think of the entry into the rivers as repeated (iterative) or ongoing (progressive); in either case the rivers are the same. Tarán objects to Marcovich's reading: "why single out merely the action of entering the river and disregard the role of the observer once he is inside the river? This would unnecessarily restrict the universal validity of the river-statement in B 12" (33). But this reply will not do. First, it does not really matter what stage of the river-crossing Heraclitus is talking about: the truth that the waters are always changing and the rivers staying the same still applies. Second, this interpretation does not really restrict the universality of the statement. Finally, to complain that the role of the observer is being ignored begs the question, since it is only on Tarán's interpretation that the waders' observations make any difference.

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[20] Marcovich, *H.* 206.

Tarán thinks that since Plato and Aristotle most likely had access to Heraclitus' text, they could not be so mistaken in their reading of Heraclitus as to miss his point. Yet recent studies have shown how conventional ancient interpretations could be. Not only did the doxographical tradition perpetuate demonstrably incorrect readings of the Presocratics, but there was a kind of proto-doxographical tradition that began with the sophists, and which tended to get recycled and repeated by Plato, Aristotle, and other early readers of the Presocratics.[21] It is quite possible that Cratylus' reading, which likely influenced Plato's, came from an earlier interpreter, namely Hippias of Elis in his *Sunagogê*.[22] And Aristotle's reading continues that of Cratylus and Plato without so much as a notice that they could be wrong (**T4**). If the interpretation given above of Plutarch is correct, we see in Plutarch how a scholar with access to Heraclitus' text could read it without noticing the discrepancy between something like A6 and the actual words of Heraclitus.

It appears from the verbal similarities among the three alleged fragments, from the messages they convey and the settings in which they are reproduced, that we can account for all other statements about the river on the basis of B 12 alone. As for Tarán's reading of B 12, that seems unpromising at best. Tarán makes a good deal of the context of the two alleged fragments he recognizes, and he does a good job of rejecting the context in which B 12 was quoted. But when all is said and done, that simply means that in fact we have no context for B 12. We must, as it were, infer the context from the meaning of the fragment and not vice versa. It is, indeed, possible, as one prominent view of Heraclitus' text would have it, that there is no extended argument in the book in any case, but rather a collection of epigrams and riddles.[23] If that is so, even having the original book would not necessarily provide an illuminating context for the meaning of the fragment. In any case, we do not have the original sequence in which B 12 appeared, and hence the whole issue of the context is an exercise in futility.

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[21] B. Snell, "Die Nachrichten über die Lehren des Thales und die Anfänge der griechischen Philosophie- und Literaturgeschichte," *Philologus* 96 (1944) 170–82; J. Mansfeld, *Studies in the Historiography of Greek Philosophy* (Assen 1990) 126–146 *et passim*.

[22] Mansfeld (above, n. 21) 84–96; A. Patzer, *Der Sophist Hippias als Philosophiehistoriker* (Freiburg 1986) 33–42, 49–55.

Fortunately, the fragment is complex in structure and rich in implications, and this very fact speaks both for its being a genuine quotation, and for its being in a certain sense an autonomous text that can be appreciated in the absence of a discursive context. In this interpretation I follow especially Kahn, but also Kirk and Marcovich, and leave for another occasion questions of the connection between this fragment and Heraclitus' larger message.

The major contrast in the fragment is between what is "the same" and what is "other." It is given by the words of the text that the rivers are the same, the waters are other. The changing waters of the river flow onto the people fording them. Accordingly, ever different waters from the same rivers flow onto people who ford them. This is the obvious reading, if anything in Heraclitus can be said to be obvious. But there is another reading. The term *toisin autoisin* 'the same' is sandwiched between *potamoisi* and *embainousin*, and it agrees not only with the former (masculine dative plural), but also with the latter. In fact, as Kahn points out, Heraclitus has gone to a good deal of trouble to create this (syntactical) ambiguity, since any one of a number of changes could avoid it (changing the word order, making one term singular, different word choice, etc.).[24] And indeed Heraclitus seems to favor putting an ambiguous term between two possible referents.[25] Let us, then, construe *toisin autoisin* with *embainousin:* other waters flow onto the same people stepping into rivers. Again there is a contrast between 'the same' and 'other'. But this time what is said to remain the same are the persons fording the river. Curiously, we get precisely the opposite sense from that envisaged by Cratylus (and Plato and Aristotle and Plutarch …), stressing the fact that the same action cannot be repeated twice because of radical flux. To the contrary, the people who encounter the river stay the same (on one reading); and the rivers they encounter (on another reading) also stay the same. There is a flux here (other and other waters), but the consequences of the flux are not chaotic non-identity, but, surprisingly, some sort of continuity and hence identity through time.

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[23] This was Diels' view, embodied in his scheme of numbering the fragments alphabetically by source. Kahn, *H.,* looks for a more coherent exposition, also defended by Barnes (above, n. 3), but the view is opposed by H. Granger, "Argumentation and Heraclitus' book," *OSAP* 26 (2004) 1–17.

[24] Rivier (above, n. 2) first called attention to the ambiguity, and argued that it should be eliminated by deleting ἐμβαίνουσιν, which he argued was inserted by a later editor.

[25] E.g., B 1, 119, 51; see Graham, "Heraclitus and Parmenides," in V. Caston and D. W. Graham (eds.), *Presocratic Philosophy: Essays in Honour of Alexander Mourelatos* (Aldershot 2002) 35–37.

At least one more feature needs to be noted in the interpretation, again following Kahn: by putting the first four words of the statement in the dative plural, Heraclitus paints with sound. He creates the sounds of a bubbling river, which, in the second clause seems to speed up and hurry off in a series of alliterations. Heraclitus is a poet as well as a philosopher, even if he does not confine himself to the conventional rhythms of Greek poetry.

IV

We see that B 12 is wonderfully complex and suggestive, a text worthy of Heraclitus and one that could not arise by chance or from a careless rendition of another text. Paraphrases lose complexity and information, as have B 49a and 91(a). But the process of interpretation has left us without a context (which the passage may have never really had in any case) and without any trust in the paraphrases that ancient interpreters derived from it.[26] Let us turn briefly to those who have championed B 12 as the dominant or only river fragment and see how they take it.

According to the originator of the interpretation I am following,

> Not a single fragment expresses the thought that all things are in flux, that in general only transition and change, never continuity and persistence are found –which will show us where the *panta rhei* is truly at home. The basic idea of Heraclitus is much rather the most precise opposite imaginable to the flux doctrine: persistence in change, constancy in alteration, *t'auton* in *metapiptein*, *metron* in *metaballein*, unity in division, eternity in destruction. (Reinhardt [above, n. 1] 206–207)

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[26] Some have wished to find the context in Arius Didymus. On this, see above, n. 10.

Kirk thinks we should be careful not simply to assimilate B 12 to the coincidence of opposites because it is not as concrete as other examples, it is not explicitly framed in this way, and because there is a danger that the same-other contrast will collapse into incoherence. Rather,

> What these river-fragments *are* intended to show, I believe, is the regularity, the order, the *metron* or measure, which Heraclitus believed to underl[ie] and to control natural change in all its forms… . The river-fragments, then, seem to exemplify not the constancy of change … but the regularity of natural change in one particular manifestation. (Kirk *H.* 36–37)[27]

Marcovich, on the other hand, sees no reason to follow Kirk in his emphasis on the regularity of change, but instead defends the discussion as an instance of the coincidence of opposites, which Kirk rejects.[28]

While these three interpretations mark an advance on those based on B 91, they all seem to miss the point to some degree. In the first place, the image Heraclitus presents us with does indeed depend on a flux: other and other waters flow. This is a kind of given in the scene. Of course, a good deal depends on just what we make of the flux portrayed in the image, but it needs to play some decisive role. As the first and third commentators recognize, there has to be some sort of connection between the two–as is often the case in Heraclitus' discussion of opposites. But then it is the precise relationship that is perhaps most important. And here, it appears, Reinhardt wants to subordinate flux to constancy; this seems problematic. Second, *contra* Kirk, B 12 is not about measure, though it may presuppose the notion: it says nothing about the amount of water involved. Further, to downplay the image as applying only to *some* kinds of change, as Kirk does, is to miss the power of the image. It is true, no doubt, that as it stands B 12 expresses just a single concrete image. But the image is powerfully suggestive, and there is no sign that he marks any boundaries to its potential applications. Finally, *contra* Marcovich, there is something that makes this case fundamentally different from most other cases of the coincidence of opposites: in at least many cases, opposites are connected because they (that is, opposite things) change into one another (B 88, 126).[29] But in B 12 we are not talking about hot and cold or waking and sleeping, but a river and its contents. The opposition occurs at a higher categorial level altogether, between, in Aristotelian terms, a substance and its matter. A substance and its matter are not opposites; the opposition arises between the sameness of form and the difference of matter: paradoxical, but not contradictory. If we want to classify this case as a coincidence of opposites, we should still recognize it as a different sort of animal than most other cases. The river example somehow represents an exceptional and unusually profound case of contrast.

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[27] Kirks's italics. Compare Kirk, *H.* 366.

[28] Marcovich, *H.* 212–213.

[29] For discussion of this, see Graham "Heraclitus' criticism" (above, n. 5) 38–44, *Explaining the Cosmos* (above, n. 5) 122–124.

As to the continuing value of the image, we may call a modern philosopher to the witness stand, namely David Hume:

> … as the nature of a river consists in the motion and change of parts; tho' in less than four and twenty hours these be totally alter'd; this hinders not the river from continuing the same during several ages.[30]

The river is interesting to Hume for precisely the reason it was interesting to Heraclitus: it is an example of an entity that remains the same even though its components change; or better yet, precisely *because* its components change. Indeed, a figure much closer in time to Heraclitus seems to echo the image. Aristotle observes:

> [S]hall we say that while the race of inhabitants remains the same, the city is also the same, although the citizens are always dying and being born, as we call rivers and fountains the same, although the water is always flowing away and more coming? (Aristotle *Politics* 1276a34–39, revised Oxford trans.)

Here rivers remains the same although their contents change, thus potentially serving as a reliable model for the sameness of city states. In this putative analogy, the transtemporal identity of rivers is assumed as a given.

And this brings us back to the question of context. Is there a context? What is it? Should there be a context? A similar question is sometimes raised concerning the road fragment: "The way up and down is one and the same" (B 60). Is this a statement roads, or about the elements, or about mortality, or about the cosmos, or something else? Both statements are, we might say, almost commonplaces, about everyday experiences. What makes them powerful is just the vividness of the concrete example. The road fragment is about roads and routes. The river fragment is about rivers and people. But both of them have implications for life, nature, cosmology. There is a unity that roads have:

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[30] *Treatise* I.4.6, p. 258 Selby-Bigge. Here Hume is concerned with conventional assessments of identity more than the strict identity which he denies to sensible objects.

whether we travel uphill or downhill, into town or out of town, there is only one road. If we go out of town on the road, we come back on the same road. This seems to be true of processes of elemental change, and of cosmic alteration. There is a kind of principle involved that manifests itself in many contexts, a kind of *logos*. As Kahn has persuasively argued, Heraclitus builds his treatise on the twin principles of *linguistic density* and *resonance*. In linguistic density "a multiplicity of ideas are expressed by a single word or phrase." 'Resonance' denotes "a relationship … by which a single verbal theme or image is echoed from one text to another in such a way that the meaning of each is enriched when they are understood together."[31] Further, "These two principles are formally complementary."[32] In effect the resonance between texts allows a passage to transcend its immediate context, whatever it was, and to connect with other passages with similar themes and motifs. If this is so, the question of context becomes less urgent and less decisive–as well as virtually unanswerable in the present state of our knowledge. We must extract the meaning from the text itself, in all its richness, and then in second place try to link it to passages with similar themes. The result is a network of associations rather than a linear argument.[33]

With the river image a commonplace about rivers comes to the fore. When we cross a river (the Greeks, we must remember, had very few bridges, even in Roman times), we pass through constantly changing waters. The river is the same, and we are the same. Indeed, without the flowing waters, there would be no river; the river is constituted by the changing waters. As we wade into the river, we confront ever changing waters, yet we are the same. By parity of reasoning, if we did not confront an every-changing experience, we would not have experience. In a certain sense, our own reaction to our experience constitutes us as stable subjects.

The scholar who sees this relationship most clearly is Charles Kahn:

> What is emphasized is that the structure and hence the identity of a given river remains fixed, despite or even because its substance is constantly changing. And if the parallel mentioned above is pressed, something similar is indicated about the structure and identity of individual human beings. (Kahn, *H.* 168)

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[31] Kahn, *H.* 89. See also a recent study using Kahn's assumptions, Gianvittorio (above, n. 10).

[32] Kahn, *H.* ibid.

[33] Which Gianvittorio (above, n. 10), ch. 2, explores as *reti di significazione*.

In this *logos* a flux is essential: without it there would be no rivers, and no waders. But paradoxically, the changing surroundings make possible a unified reality and a unified experience. A river is an enduring entity that gets its very being from its ephemeral material; a self is an enduring entity that gets its continuity from its changing encounters. There is a flux doctrine here, but not the flux doctrine that worried Cratylus, Plato, and Aristotle. Here the flux does not undermine any possibility of experience, but rather, *mirabile dictu*, makes experience possible. In fact, the message here is not so different from Aristotle's own doctrine concerning metabolism and biological existence, that higher-level structures or forms endure through exchanges of matter.[34] Indeed, the sublunary world maintains itself through the generation and destruction of its material basis:

> Nature always strives after 'the better'. Now 'being' … is better than 'not-being': but not all things can possess 'being', since they are too removed from the 'originative source'. God therefore adopted the remaining alternative and fufilled the perfection of the universe by making coming-to-be uninterrupted: for the greatest possible coherence would thus be secured to existence … . (Aristotle *On Coming To Be and Passing Away* 336b28–33, trans. Joachim)

In the same way, it appears that for Heraclitus the whole cosmos is everlasting precisely because parts of it are constantly undergoing material changes (B30). Thus we seem to be justified in seeing the flux doctrine as having application to the cosmos as well as to rivers and people. In Heraclitus' world, relatively stable structures supervene on constantly changing matter.

B 12 is the river fragment, Heraclitus' one and only statement of the flux. The sage of Ephesus believes in the flux of matter, but not a flux that erodes all landmarks and makes knowledge and communication impossible. Rather, his flux brings stability to rivers, life to animals, coherent experience to men, and everlasting existence to the cosmos itself. Or rather, there are regularities that govern flux, that order the exchanges of opposite characteristics. While the changes are continuous, the regularities balance them out and ensure a higher-level order in the world. Like Adam Smith's Invisible Hand that maintains the balance of market forces in an economy, Heraclitus' scheme maintains a balance of material forces. The mysterious entity he calls the Logos can be seen as just the expression of systematic order in nature. No less real than the constant exchange of hot and cold, wet and dry, earth, water, and fire is the constant replacement of what is lost by a new supply, drawn from what is lost of the contrary stuff. The world needs constant flux and interchange at the level of material, on which a hidden law operates to maintain balance. The cosmos is an ever-living fire precisely because it lives in its own transformation of opposites; it stays the same as it changes.[35]

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[34] A theme stressed by M. Furth, *Substance, Form and Psyche: An Aristotelian Metaphysics*. Cambridge 1988.

There is one way that Heraclitus' theory is profoundly different from that of all other early philosophers of nature. Whereas they attempt to explain change in terms of constant realities and their modifications, Heraclitus attempts to explain constancy in terms of ongoing change. Whereas in some metaphysical sense they are all philosophers of stasis, for whom (especially from Parmenides on) stability is fundamental and change problematic, Heraclitus is a philosopher of process, for whom change is fundamental and stability problematic. But if he is a process philosopher, he is not a nihilist or an epistemological or ontological anarchist. His world is orderly through and through, the forces balanced, the elements proportionate, the cosmos stable. Like a river.[36]

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[35] B 30, 31, 90.

[36] My thanks to my fellow symposiasts for helpful comments. On process philosophy, see now my "Heraclitus as a process philosopher," *Philosophy Study* 2 (2011) 1–8.

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12. Heraclitus' Ethics

David Sider

Investigations into Heraclitus' ethics are scarce on the ground. It is not that, apart from some that have been been overlooked because they are universally considered spurious, his several comments that touch upon human behavior have been ignored—there are too few fragments for any to go uncommented for long—but that they seem isolated and not obviously calling out to be made part of a systematic theory of ethical behavior. Furthermore, it has to be said that some of these scarce attempts to study Heraclitus' ethics are disappointing.[1] Nor does the subject of ethics as such receive much attention in more comprehensive treatments. It is true that ethics is discussed elsewhere in the huge Heraclitus bibliography, but rarely head-on as a subject to be investigated and analyzed in its own right.[2] Two noteworthy contributions to the literature are a brief contribution by Robert Bolton, which acknowledges that it is only a preliminary study, and the more substantial investigation by J. W. Evans, which, because it was only an unpublished doctoral dissertation, has not received the attention it deserves.[3] It was with this near vacuum on the subject in mind that I planned to address the matter at the conference on Pythagoras and Heraclitus, little knowing that Enrique Hülsz (who calls Heraclitus a "moral philosopher") and Tony Long would be addressing this very question directly and that others, most notably Aryeh Finkelberg and Gabor Betegh, would be shedding significant light on the matter. Still, our various approaches complement each other, and each may have something to contribute to a new overall appreciation. In particular, Tony Long has properly noted how misleading it can be to read Plato back into Heraclitus. Yet my approach to Heraclitus' ethics based on the fragments themselves will lead to a theory that is consistent with much that is in fact found in Plato.

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[1] Thus, A. N. Zoumpos, "Das 'ethische Urteil' bei Heraklit," *Platon* 11 (1959) 420–423, raises the Aristotelian distinction between a-priori and a-posteriori reasoning, only to find that this does not apply to Heraclitus, which does not get us very far: "Kurz gesagt nimmt Herakleitos das 'ethische Urteil' als Produkt des 'Göttlichen Logos' an, das naturgemäss also in Voraus in den Menschen vorhande ist." (One could compare Anaxagoras' Nous, which also shows up in animals.) Zoumpos relies too heavily on Plato for his understanding of Heraclitus, especially those passages in the *Cratylus* and *Theaetetus* that characterize him primarily as one relying on a theory of flux to explain his epistemological concerns. Zoumpos thus concludes that "der Mensch kein sichers Urteil bilden kann," since there can be no *Seiende*, existence, in Heraclitus. There is, however, *logos*, styled as *Weltgesetz* by Zoumpos, which can offer guidance to men, should they care to follow it. C. J. Broniak, "Heraclitus, Parmenides, and Plato on living the good life," *Dialogue* (Milwaukee) 30 (1987) 28–37, devotes only a little over one page to Heraclitus (28–29), with very little attempt to work the fragments themselves into a coherent system. C. Eggers Lan, "Ethical-religious meaning of fr. 30 D.-K." in L. Rossetti (ed.), *Atti del symposium heracliteum 1981* (Rome 1983) 1.291–299, does not follow through on the promise of his title.

[2] Some few examples chosen from the best and most useful books on Heraclitus: Charles Kahn, *The Art and Thought of Heraclitus* (Cambridge 1979) does not even include a listing for ethics in his index; Miroslav Marcovich, *Heraclitus: Greek Text with a Short Commentary* (Merida 1967) does index "ethics," but

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he assumes without argument that Heraclitus' ethics were very much those of the ruling class of his native Ephesos, which entails that Heraclitus never developed an ethical system of his own. Cf. too M. Adomenas, "Heraclitus on religion," *Phronesis* 44 (1999) 109, who refers to Heraclitus' "antipopulist ethics." This will be disputed below.

[3] R. Bolton, "Nature and human good in Heraclitus," in K. I. Boudouris (ed.), *Ionian Philosophy* (Athens 1989) 49–57; J.W. Evans, *Heraclitus and Parmenides as Moral Philosophers*, diss. Yale 1970. Bolton approaches Heraclitus' ethics via the notion of natural law as it would have incorporated Heraclitus' idea of *physis*. Placing Heraclitus broadly in an early form of the *nomos/physis* controversy, Bolton relies most heavily on B 114 ξὺν νόῳ λέγοντας ἰσχυρίζεσθαι χρὴ τῷ ξυνῷ πάντων …. τρέφονται γὰρ πάντες οἱ ἀνθρώπειοι νόμοι ὑπὸ ἑνὸς, τοῦ θείου. From this, along with some other supporting texts, Bolton reasonably concludes not only that is there a natural (because divine) law, but also that men can access it and trust in it. Note also B 116 ἀνθρώποισι πᾶσι μέτεστι γινώσκειν ἑωυτοὺς καὶ σωφρονεῖν, where "self-knowledge is coupled with *sophronein*" (54). Bolton then offers some criticisms that could be brought to bear, but his article remains a good place to start. Evans' more comprehensive treatment argues that "Heraclitus' ethical views are inseparably entwined with his cosmology and metaphysics" (39).

M. Fattal, *Paroles et actes chez Héraclite: Sur les fondements théoriques de l'action morale* (Paris 2012), appeared as this article was on the point of submission to the publishers.

I

Before beginning, however, it should be noted that, despite the modern neglect, several voices in antiquity were in agreement that the book of Heraclitus did indeed devote a significant portion of its contents to ethics or politics, a subject not always easy to distinguish from ethics in the fragments, nor, I suspect, in Heraclitus' own thought. Thus, Diogenes Laertius 9.15 records that "many have written commentaries on Heraclitus, including the *grammatikos* Diodotos, who denied that his *syngramma* was about nature, but rather that it was about politics, and that the material on nature was placed there (only) as a paradigm (οὔ φησι περὶ φύσεως εἶναι τὸ σύγγραμμα ἀλλὰ περὶ πολιτείας, τὰ δὲ περὶ φύσεως ἐν παραδείγματος εἴδει κεῖσθαι). Again from Diogenes (9.12) we learn that this same Diodotus described Heraclitus' book as an ἀκριβὲς οἰάκισμα πρὸς στάθμην βίου, "accurate steerage toward life's harbor."[4] Diodotus Grammaticus is unknown, but whoever he was, he probably was not a professional philosopher, most of whom in the ancient world seemed ready if not eager to ignore the ethical views of Socrates' predecessors.[5] Still others, according to D.L. ibid., call Heraclitus' book a γνώμον' ἠθῶν, τρόπου κόσμον ἕνα τῶν ξυμπάντων, "a guide of conduct, …."[6]

Diogenes Laertius also records the interesting statement (9.5) that τὸ δὲ φερόμενον αὐτοῦ βιβλίον ἐστὶ μὲν ἀπὸ τοῦ συνέχοντος Περὶ φύσεως, διῄρηται δ' εἰς τρεῖς λόγους, εἴς τε τὸν περὶ τοῦ παντὸς καὶ πολιτικὸν καὶ θεολογικόν. Heraclitus' book, although περὶ φύσεως on the whole, has been divided into three *logoi*, one on τὸ πᾶν, which must include at least cosmological matters; a second on politics, and a third on divine matters. A straightforward reading of this passage—focusing on the present ἐστί—would allow for somebody simply adding "chapter headings," without any further alteration, but this would hardly merit mention by Diogenes. The perfect "has been divided" would never have been used if this were Heraclitus' own division. By concentrating on the odd phrase ἀπὸ τοῦ συνέχοντος, however, which seems to mean that the book was originally continuously on, or continually returning to, the subject of nature, we get the more interesting statement (one that Diogenes would have found deserving of mention) that Heraclitus' book suffered rearrangement into the three rubrics/sections he names. If so, there must have been a higher percentage of the book concerning, at least on a first reading of Heraclitus' notoriously ambiguous prose, human nature (politics and ethics, as later understood).[7] And as Deichgräber noted, these topics are three of the six into which Cleanthes divided philosophy, which suggests that the rearrangement and division into three parts were due to a Stoic.[8]

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[4] The Greek is a iambic trimeter, with its caesura preceding the fourth rather than the third princeps. Since *grammatikoi* were teachers, Diodotus may have composed verses to serve as mnemonic aids for his students. For a recent discovery of a teacher's verses directed to his students, see R. Cribiore, D. Ratzen, & P. Davoli, "A teacher's dipinto from Trimithis (Dakhleh Oasis)," *Journal of Roman Archaeology* 21 (2008): 170–91.

[5] Note how Aristotle in his *Ethics,* although coming to grips with Plato in *EN* 1.6, does not provide in this work the same sort of overview of presocratic or sophistic thought on the subject that he does in his *Physics* and *Metaphysics.*

[6] The reading of the codd., printed here, is not easy to construe, and has been frequently altered:

καὶ γνώμον' ἠθῶν, <καὶ καλὸν> κόσμον τρόπων ἑνός τε συμπάντων Diels;
καὶ γνώμον' ἠθῶν, <τοῦ θ' ὅλου> κόσμου τρόπιν ἑνός τε συμπάντων τε Hicks.

These important secondary testimonia aside, Heraclitus was clearly concerned with both individual behavior (B 43 ὕβριν χρὴ σβεννύναι μᾶλλον ἢ πυρκαϊήν), as well as that of his city (B 44 μάχεσθαι χρὴ τὸν δῆμον ὑπὲρ τοῦ νόμου). It remains, however, for us to place these gnomic thoughts into a more complex system of ethical behavior.

Whatever the precise form of Heraclitus' original book, it is clear that those who could read it acknowledged that a significant part concerned ethics—even if, as Diodotus said, on the surface it seemed to be speaking about nature. That is, as I believe but cannot argue for at length here, Heraclitus moved rapidly from "topic" to "topic," so that, as one possible example, his two statements about the hidden (but not unrecoverable) meaning of both Apollo and of nature (B 93, 123) could have come close together in his first edition but have been segregated later into the theological and the physical parts, respectively.

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[7] The main problem lies in the phrase ἀπὸ τοῦ συνέχοντος. The related adjective συνεχές is regularly applied to "continous" words, phrases, etc. (LSJ s.v. I 2). The verb, however, does not seem to be used in this sense, but perhaps its basic sense of "embrace, comprise, hold together" can suggest a translation of the phrase as "from that which holds the work together as a whole," i.e., that *physis* is a constant topic throughout the work.

[8] K. Deichgräber, "Bemerkungen zu Diogenes' Bericht über Heraklit," *Philologus* 93 (1938–39) 19. The remaining parts are dialectic, rhetoric, and ethics (D.L. 7.41), the last of which, as I have suggested, may have been too hard to distinguish from politics in Heraclitus' writings. On the other hand, R. Hirzel, *Untersuchungen zu Ciceros philosophischer Schriften* (Leipzig 1882) 2.70–178, argued that Cleanthes' six-part division was an expansion of that which he found in Heraclitus. See further, Dilcher, *H.* 188–189.

II

Let us begin our attempt to provide an overall view of Heraclitus' ethical thought by considering B 29 αἱρεῦνται γὰρ ἓν ἀντὶ ἁπάντων οἱ ἄριστοι, κλέος ἀέναον θνητῶν· οἱ δὲ πολλοὶ κεκόρηνται ὅκωσπερ κτήνεα, which is regularly taken as an expression of Heraclitus' approval of his own aristocratic class—as seems obvious from the standard translation of the first clause (in whatever language): "The best men [a term the nobility applies to itself; see Nietzsche's *Genealogy of Morals*] choose one thing in place of [= over] all things: everlasting fame from mortal things."[9] It is also further thought that Heraclitus is here alluding to Simonides' famous lyrics on the fallen at Thermopylae (531 *PMG*):

> τῶν ἐν Θερμοπύλαις θανόντων 1
> …·
> ἐντάφιον δὲ τοιοῦτον οὔτ' εὐρὼς
> οὔθ' ὁ πανδαμάτωρ ἀμαυρώσει χρόνος. 5
> … Λεωνίδας, 7
> Σπάρτας βασιλεύς, ἀρετᾶς μέγαν λελοιπὼς
> κόσμον ἀέναόν τε κλέος

To ignore Heraclitus' use of the word for the moment, Simonides, presumably very soon after 480 B.C., is the first to use the adjective *ἀέναος* in this extended sense. Up until the beginning of the fifth century, *ἀέναος* is always applied to water (Homer, Hesiod).[10] For Simonides and Pindar, "everlasting" is an easy metaphorical extension of "ever-flowing," but how would Heraclitus, whether on his own or by borrowing from a predecessor, have made use of the word in this extended sense?—Heraclitus, who so famously made his readers question the stability or "sameness" of rivers?[11] For him, ever-flowing fame all by itself would be a suspect phrase all by itself; add the word θνητῶν and it seems to lose all positive force, especially when B 12 ποταμοῖσι τοῖσιν αὐτοῖσιν ἐμβαίνουσιν ἕτερα καὶ ἕτερα ὕδατα ἐπιρρεῖ is read with τοῖσιν αὐτοῖσιν taken ἀπὸ κοινοῦ with rivers and the steppers-in, so that the stability of men too is subject to doubt.[12] To be more specific, Heraclitus himself would have no objections to things in flux (everything is), since he has the ability to understand such things; but, as so many of his fragments show, he is not prepared to grant this ability to others.

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[9] This is my translation. Some examples from others: "I migliori, in cambio di tutto, ciò, una cosa scelgono: la gloria eterna presso i mortali" (A. Capizzi, *Eraclito e la sua leggenda* [Rome 1979] 75; "Denn eins gibt es, was die Besten allem anderen vorziehen: den ewigen Ruhm den vergänglichen Dingen" (DK); "Ils prennent une chose contre toutes, les meilleurs, gloire toujours jaillissante des mortels" (J. Bollack & H. Wissmann, *Héraclite ou la séparation* [Paris 1972] 128. It will be clear from my translation that I take ἀντὶ ἁπάντων as a neuter phrase (*contra* Bollack-Wissmann), and θνητῶν as neuter (but, *contra* Diels, not with an understood ἀντί; see further, below).

[10] The simple ἀέ for ἀεί was used by Pisander F 12 Bernabé and perhaps by Pindar *P.* 9.8 as well, if Hermann's conjecture is accepted. Ignored here are two examples from Pindar: *P.* 1.6 ἀενάνου πυρός (fire is fluid) and the metaphorical *O.* 14.12 ἀ. τιμάν, in the belief that Simonides' poem would have been recited in Ephesus soon after composition, whereas Pindar's epinicia (for patrons in

To return to B 29, there may indeed be men who chose one thing over all, κλέος ἀέναον θνητῶν, but are these men really "the best"? Once this is put in question, the plural *aristoi* also begins to look suspicious. It is not one class of men whom Heraclitus would put forth as a model, but rather one man, whom in fact he calls the best and all by himself worthy of many: B 49 εἷς ἐμοὶ μύριοι, ἐὰν ἄριστος ᾖ.[13] Similar is B 33 νόμος καὶ βουλῇ πείθεσθαι ἑνός.

The relative chronology between Heraclitus' and Simonides' use of *κλέος ἀέναον* is unknown. The ancient testimony for the death of the former is rather confused, but 484 would seem to be the absolute earliest date; a later date remains quite possible.[14] If so—and this is what I be-

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Orchomenus and Etna, respectively) would have had a more limited fame soon after composition.

[11] See Graham in this volume.

[12] See D. Sider, "Word order and sense in Heraclitus: Fragment One and the river fragment," in K. Boudouris (ed.), *Ionian Philosophy* (Athens 1989) 363-368.

[13] As Marcovich ad loc. notes, Heraclitus' original words are open to doubt, since this reasonable reconstruction from the several citators forms, less one initial syllable (e. g., ἔσθ' Marc.), an iambic tetrameter. Scythinus' versification may have supplanted the original, which itself may well have had a metrical clausula. In this case, taking note of the fact that several witnesses insert the phrase ἀντὶ πολλῶν, we may entertain the notion not only that this phrase was original, but also that B 29, with ἕν, ἀντί, and ἄριστοι, originally appeared very close to, and in obvious contrast to, B 49.

[14] Serge Mouraviev, *Heraclitea* III.1: *Recensio: Memoria* (Sankt Augustin 2003) 124–126, has argued for placing Heraclitus' death as late as 460, but this has been criticized by Aryeh Finkelberg in his review of this volume, *SCI* 25 (2006) 151. For the inconsistent testimony, see further Jaap Mansfeld, "The

lieve to be the case—it seems to more likely that Heraclitus was responding to Simonides (and the favorable reaction his poem no doubt received in Ephesus) than the reverse.[15] Read this way, Ephesus' "best" are in fact *not* the best, and Heraclitus would be playing on words in a way that becomes more familiar later in the fifth century.[16] On the surface, where The Best are to see nothing but a compliment, θνητῶν has been taken as masculine with an understood πρός, "by men"; or neuter with a somewhat more easily understood ἀντί, "instead of mortal things." I am happy with either of these (or both) as the surface meaning, but, keeping the underlying pejorative meaning in mind, we can also understand it as a simple causative genitive: "The [*soi-disant*] Best choose an ever-changing reputation (*kleos*) *for* mortal things."

The entire fragment has always been read as if the two clauses were in complete contrast, although there is in fact no evidence for a μέν in the first clause. Thus, instead of a contrast between the upper and lower classes, as is usually understood, the second clause, following the first as explained above, can now be rendered "and the majority [sc. of them, the *aristoi*] glut themselves like cattle." In other words, Heraclitean ethics loves to hide. οἱ ἄριστοι are not in fact ἄριστοι, and some of them are no better than οἱ πολλοί, the people they generally despise. Thus, although Heraclitus may not be a friend of οἱ πολλοί, neither is he to be taken as a staunch defender of the upper classes. More on this later.

Along the same lines, but somewhat more obvious is B 28 δοκέοντα ὁ δοκιμώτατος γινώσκει φυλάσσειν,[17] "the person whose *doxa* is greatest knows how to hold on to his beliefs," which also admits of both complimentary and pejorative interpretations, depending on whether *doxa* means one's own judgement (cf. Parm. B 1.30, which also combines δόξας and δοκοῦντα, along with δοκίμως; 8.51) or the judgement in which one is held by others, i.e., fame (cf. Sol. 13.4, 34 and *CEG* 396 [vi c. BC] δὸς δὲ ϝ' ἰν ἄνθρώποις δόξαν ἔχειν ἀγαθάν, "Grant that

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chronology of Anaxagoras' Athenian period and the date of his trial," *Mnemosyne* 32 (1979) 68–69.

[15] Another close echo between the two is the phrase ὕβριν σβεννύναι (Her. B 43 & Simonides 3 *PMG*), which could go in either direction, if in fact each is not independently elaborating on the Homeric phrases σ. χόλον and σ. μένος.

[16] Cf., e.g., Euripides *Ba.* 395 τὸ σοφὸν οὐ σοφία, which in thought returns us to Heraclitus B 40 πουλυμαθία νόον οὐ διδάσκει, as was noticed by Sandys ad Eur. *Ba.* 395. Note also Thuc. 3.82.4–7 on how words changed meaning.

[17] My text remains as close to the mss. as possible; for γιγνώσκω + inf., cf. Soph. *Ant.* 1089 γνῷ τρέφειν, "learn how to."

he have a good reputation among men"). It is beginning to look as though Heraclitus did not direct his ethical statements at those men who were most in need of them. With this, compare the ethical belief attributed to Heraclitus in an anonymous collection: Gnomol. Vatic. 315 (B 135) συντομωτάτην ὁδὸν ἔλεγεν εἰς εὐδοξίαν τὸ γενέσθαι ἀγαθόν, "becoming good is the shortest path to εὐδοξία." As the high D-K number (above 126) indicates, this was considered spurious by Diels, as it was also by Marcovich, and it is true that few would want to credit Heraclitus with the banal, and perhaps perverse, thought that becoming good is the shortest path to glory—but what if this too were originally a statement that, although superficially appealing to foolish seekers after fame, also contained the message that becoming good (however Heraclitus may have expressed it in his own words) was the most direct route to *eu-doxia*, "virtue," much as in Pindar *Nem*. 3.40 συγγενεῖ δέ τις εὐδοξίᾳ μέγα βρίθει, "he is greatly powerful in his instinctive good thoughts," although Heraclitus doubtless would intend something more intellectual than Pindar.

Since paths usually have destinations or goals, it may be that another usually neglected testimonium is relevant: Clem. *Strom*. 2.130 (A 21) φάναι τοῦ βίου τέλος εἶναι … Ἡράκλειτόν … τὴν εὐαρέστησιν. See also Theodoret, who said that Heraclitus chose εὐαρέστησις instead of ἡδονή.[18] In what context anyone would prefer εὐαρέστησις, "satisfaction," to pleasure is not easy to reconstruct. Satisfaction, furthermore, seems an unlikely life's goal for the amusingly irascible and arrogant Heraclitus.[19] Perhaps this late word conceals an original pun on, or a misunderstanding of, εὐ + ἀρετή; or, somewhat more likely, on εὐ + ἀριστεύω. Compare the Homeric line αἰέν ἀριστεύειν καὶ ὑπείροχον ἄλλων (*Il*. 6.240). If so, this testimony nicely complements B 135, so that "thought," "virtue," "becoming good," and being "best" (in the proper way) all are key ideas in Heraclitus' ethics. Of these, *doxa* is especially important in that it points towards the intellectual basis of his ethics, as we shall see further below. For now, let's briefly adduce Albertus Magnus *de veget*. 6.401 (B 4) "Heraclitus dixit quod *Si felicitas esset in*

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[18] *Graec.Aff*. 11.7 (p. 185 Marc.) καὶ Ἡράκλειτος δὲ ὁ Ἐφέσιος τὴν μὲν προσηγορίαν μετέβαλε, τὴν δὲ διάνοιαν καταλέλοιπεν· ἀντὶ γὰρ τῆς ἡδονῆς εὐαρέστησιν τέθεικεν.

[19] Heraclitus was μεγαλόφρων … καὶ ὑπερόπτης (D.L. 9.1); see further Mouraviev (above, n. 13) 25–6. Plato, to whom we shall be comparing Heraclitus later, avoids these charges by having *his* best man be someone other than himself.

delectationibus corporis, boves felices diceremeus, cum inveniant ὄροβον ad comedendum," which if nothing else strongly suggests that for Heraclitus happiness lies in the delights of the soul,[20] but perhaps we do not need Albertus for this unstartling thought.

Stob. 3.1.178 (B 112, here without punctuation) σωφρονεῖν ἀρετὴ μεγίστη καὶ σοφίη ἀληθέα λέγειν καὶ ποιεῖν κατὰ φύσιν ἐπαΐοντας allows for several possible construals,[21] but, however one parses it, the fragment, although consistent with the ones we have been examining, clearly goes further in associating human virtue with, superlatively, mental activity, which, furthermore, is now associated not only with understanding nature but also with its expression in words, presumably for the purpose of convincing others of this truth; i. e., in order to better them. So, then, one construal: "The greatest virtue and wisdom is to be *sophron*—to speak and act truly, perceiving (things) in accord with nature."[22] But there is no way to pin this sentence down. Just as Heraclitus in the river fragment (see above) elevates the puzzle from word to the underlying idea (from "what word is modified by 'same'" to "what does it mean to say something is the same"?), so too here one puzzles over *sophrosyne, arete*, etc., first on the level of grammar but then on a more philosophical one.

III

Thus far, we have been slowly building up a picture of Heraclitus' ethics from individual fragments and testimony that directly touch upon the subject. Let us now try a wider approach, based on the idea that Heraclitus' *logos* represents (*inter alia*) an account or system that unifies a disparate array of objects or data: a unity that comprises and makes sense of what even may be regarded as opposites. Since this *logos* (see in particular B 1) seems to be all inclusive, it should, if Heraclitus is to be consistent, serve to frame an ethical theory as well. It comes as no surprise, therefore, that here too Heraclitus is fond of associating, or rather equating, what ordinary people think of as opposites.

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[20] Again, as in the case of "satisfaction," one wonders what Heraclitean word or root *felicitas* actually represents. A good guess would be εὐδαιμον-, which would allow for some Heraclitean punning of the sort we have been examining.

[21] See, e. g., Marcovich, *H.* 96 (who regards these words as a reminiscence of B 114). On the accuracy of Stobaeus' quotations from Heraclitus, see Dilcher, *H.* 21 n. 30, who points out that B 116 is transmitted in a more archaic form by Sextus than by Stobaeus. In the case of B 112, however, the difficulties moderns have in parsing argues for an accurate transcription by Stobaeus.

[22] ἀληθέα ποιεῖν is only slightly odd (*contra* Marcovich) and in any case can be forgiven as a slight zeugma. One may also take σωφροσύνη as the predicate of ἀρετή and σοφία, both modified by μεγίστη; I don't think Heraclitus would mind. Or, understand σοφία as the subject of λέγειν. Or …. (one could go on).

Should the good man be just, as might seeem obvious in a pre-Sophistic age? Heraclitus, at least at first glance, seems to be saying something otherwise: Origen *C.Cels.* 6.42 (B 80) εἰδέ<ναι> δὲ χρὴ τὸν πόλεμον ἐόντα ξυνόν, καὶ δίκην ἔριν, καὶ γινόμενα πάντα κατ᾽ ἔριν καὶ χρεών, "it is necessary to know that war is universal and justice is strife; and that everything comes about in accord with strife and necessity."[23] Men may want to throw up their hands at trying to deal with such an universe, but, as Pangloss might put it, τῷ μὲν θεῷ καλὰ πάντα καὶ ἀγαθὰ καὶ δίκαια, ἄνθρωποι δὲ ἃ μὲν ἄδικα ὑπειλήφασιν ἃ δὲ δίκαια (Porphyry *Qu.Hom.* ad *Il.* 4.4 = B 102). Gods, that is, recognize that what men may choose to call strife and justice are in fact subsumed under the latter, which comprises the former as well, much as (in Greek and other languages) day (the 24-hour cycle) comprises day (the hours of sunlight) and night.[24]

If so, mankind too may divide into two camps, comparable to day/night and justice/strife. The best man and the fool (βλάξ, B 87)[25] have, though, more than humanity in common; they are also united by their city wall as well as by the more abstract civil *nomos*. D.L. 9.1 (B 44) μάχεσθαι χρὴ τὸν δῆμον ὑπὲρ τοῦ νόμου ὅκωσπερ τείχεος should probably not to be taken as an aristocratic statement (as Marcovich does without argument), but as a more comprehensive one that does not distinguish social classes, all of whom are protected the one law and the one wall. The wall, though, solidly visible and fixed in place, has a known history and a manifest structure. Where should its equivalent, the *nomos,* come from? Not from *hoi aristoi*, but from *ho aristos*, as we saw earlier in the discussion of B 33 and 49, which demonstrate the ethical facet of the one and the many. That is, just as one should "listen to" (= comprehend) the *logos*, which makes sense of the universe, one should (*a fortiori*, if the *logos* is to be all inclusive) look to/atttend to/ comprehend the unity that guides human behavior. The city wall is its symbolic physical manifestation; a *nomos* devised by the best man keeps the *demos* within less visible but more pervasive limits.[26] It is of course only loosely that one speaks of *the* (one) *nomos*, when in fact what is meant are all the laws of the city and the customs of its citizens. And a curse on those of his fellow Ephesians, especially *hoi aristoi*, who do not recognize the value of *ho aristos*, saying ἡμέων μηδὲ εἷς ὀνήϊστος ἔστω, "Let *not even one* of us be the most beneficial (to the city)" (Strabo 14.25 = B 121).[27]

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[23] The "necessity" of knowing what comes about through "necessity" makes for an interesting rhetorical and epistemological *kyklos*. On this fragment, see further Evans (above, n. 3) 41.

[24] And in biological terminology, man (the species) comprises man (the gender) and woman, which allows for an article such as T. McKeown and R. G. Record, "Observations on foetal growth in multiple pregnancy in man," *Journal of Endocrinology* 8 (1952) 386–401; cf. the occasional ἡ ἄνθρωπος. It is interesting, but ultimately not very helpful, to compare Heraclitus' statements about wholes, parts, and "opposites" with those of Aristotle about universals, particulars, and negations; cf., e.g., *Int.* 20a16–31.

[25] What Heraclitus thinks about foolish men is nicely surveyed by Dilcher, *H.* 18–26.

Still, the (one) *nomos* should not be lost sight of. Its unifying force is more explicit in B 114 (Stob. 3.1.179) ξὺν νόῳ λέγοντας ἰσχυρίζεσθαι χρὴ τῷ ξυνῷ πάντων, ὅκωσπερ νόμῳ πόλις, καὶ πολὺ ἰσχυροτέρως. τρέφονται γὰρ πάντες οἱ ἀνθρώπειοι νόμοι ὑπὸ ἑνὸς τοῦ θείου, which makes νόμος equivalent to τὸ κοινόν. Its word play also nicely links the struggle for τὸ κοινόν with an intellectual endeavor (ξὺν νόῳ ~ τῷ ξυνῷ). Note too how τὸ κοινόν in this political context does not distinguish among classes. Further, the simile formed by ὅκωσπερ makes the most important activity of intelligent people (i. e., those capable of ξὺν νόῳ λέγοντας) essentially a political struggle, even if it is for their own ultimate good. (For the last sentence in this context translates readily into τρεφόμεθα γὰρ πάντες οἱ ἄνθρωποι κτλ) Complementary to this thought is D.L. 9.73 (B 47) μὴ εἰκῆ περὶ τῶν μεγίστων συμβαλλώμεθα. A similar pairing of the political with the material is D.L. 9.2 (B 43) ὕβριν χρὴ σβεννύναι μᾶλλον ἢ πυρκαϊὴν, where the hybris to be quenched is more likely to be that of another person or group rather than one's own, although I would not want absolutely to exclude the latter.[28]

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[26] "Thus it is the νόμος which constitutes a city so that it is more than just an assembly of people. It shapes the behaviour of the individuals and so makes a true unity" (Dilcher, *H.* 49 f.). P. Wheelwright, *Heraclitus* (Princeton 1959) 88, offers a semireligious idea of Heraclitus' city wall which nicely complements the one offered here: It is "a kind of magical encirclement, representing and guaranteeing some kind of supernatural protection." See also Evans (above, n. 3) 16 f., who puts B 44 into the larger context of Heraclitus' statements about *nomos*.

[27] Heraclitus somewhat maliciously has the Ephesians indulge in rhetorical overkill, as if more than one person could be the *the* most (of anything).

The thrust of B 114, therefore, is for intelligent men to direct their speech towards the best, in large part because divinely guided, political activity. As is shown by B 2, that which is common is the *logos*, awareness of which directs men to live better lives: Sext. Emp. *adv.math.* 7.133 διὸ δεῖ ἕπεσθαι τῷ ξυνῷ, τοῦ λόγου δ' ἐόντος ξυνοῦ ζώουσιν οἱ πολλοὶ ὡς ἰδίαν ἔχοντες φρόνησιν. Taken together, then, B 44, 114, and 2 make a strong case for living an ethical life.[29] That is, the fragments we have looked at are designed to direct mens' actions, the ἔργα mentioned in B 1, of which some men are ignorant.[30]

Once again, it seems that, although Heraclitus was born into the aristocracy, he clearly was not prepared to defend each and every member of that class, certainly not those who banished Hermodorus (B 121), who had been a νομοθέτης for the Ephesians.[31] It is even more noteworthy that Heraclitus did not despise the lower classes. He seems, in fact, to have argued that everybody has the same potential for intellectual enlightenment: Stob. 3.5.6 (B 116) ἀνθρώποισι πᾶσι μέτεστι γινώσκειν ἑωυτοὺς καὶ σωφρονεῖν and Stob. 3.1.179 (B 113) ξυνόν ἐστι πᾶσι τὸ φρονέειν. These are, for Heraclitus' time, remarkable statements. What Heraclitus demanded of himself (cf. Plut. *adv. Col.* 1118c = B 101 ἐδιζησάμην ἐμεωυτόν, "I examined myself"),[32] and what he regarded as the greatest virtue, *sophrosyne* (see above, on B 112), are open to everybody.

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[28] An internal hybris would fit well with B 85 θυμῷ μάχεσθαι χαλεπόν. Arguing for external hybris is, e.g., C. Diano and G. Serra, *Eraclito: I frammenti e le testimonianze* (Milan 1980) 186 f., and Marcovich, *H.* 532 (against Kirk and Verdenius), who, however, following his usual line, adducing Theognis, argues that the hybris is that of the *demos* alone.

[29] Marcovich, in fact, combines B 114 and 2 to produce his fragment 23. It should also be noted that in these and other fragments Heraclitus does not hesitate to tell men what they ought to do, which is the hallmark of the ethicist as opposed to a dispassionate observer of human behavior: χρή in B 35 (of doubtful authenticity, however), 43, 44, 80, 114; δεῖ in B 2; and ἄξιον in B 121.

[30] B 1 (in part) ἀπείροισεν ἐοίκασι πειρώμενοι καὶ ἐπέων καὶ ἔργων τοιούτων ὁκοίων διηγεῦμαι.

[31] For what little testimony there is on Hermodorus, see Mouraviev (above, n. 13) 16 f. An untrustworthy account (Pomponius ap. *Digest.* 1.2.2.4, Plin. *NH* 34.21) has Hermodorus advising the first decemvirate in the mid-fifth century, which would suggest that he was a contemporary of Heraclitus.

[32] Which in fact Plutarch and others immediately link to the Delphic γνῶθι σαυτόν. Marcovich's "I asked myself" and his rejection of the usual meaning are

This helps to explain his anger at fools: they had the chance but rejected it. Hence too his attitude towards children, which also is relevant to his ethical theory. Note Hippol. 9.9.3–4 (B 52) αἰὼν παῖς ἐστι παίζων, πεσσεύων· παιδὸς ἡ βασιληίη, "human life is a child playing childish games; to the child belongs the power of a king."[33] It is not that an adult should act like a child; quite the reverse—cf. Celsius ap. Orig. *C.Cels*. 6.12 (B 79) ἀνὴρ νήπιος ἤκουσε πρὸς δαίμονος ὅκωσπερ παῖς πρὸς ἀνδρός—, but in each child is the hope and the potential to be the one, the best, whose βουλή will be followed by the city. Children, however, should not learn from or be influenced by their childish parents: Marc. Aur. 4.46 (B 74) οὐ δεῖ παῖδας τοκεώνων, "children should not be of their parents"; that is, they should think and act for themselves, since parents corrupt their children.[34] Note the assumption of childhood innocence in Strabo 14.25 (B 121) ἄξιον Ἐφεσίοις ἡβηδὸν ἀπάγξασθαι πᾶσι καὶ τοῖς ἀνήβοις τὴν πόλιν καταλιπεῖν, "Hang the Ephesians and leave the city to the boys…"—boys, by the way, who are capable of leading their tipsy elders when they have lost their way: Stob. 3.5.7 (B 117) ἀνὴρ ὁκόταν μεθυσθῇ, ἄγεται ὑπὸ παιδὸς ἀνήβου σφαλλόμενος, οὐκ ἐπαΐων ὅκη βαίνει, surely not a sentence meant to be limited to its literal meaning.

Heraclitus' ethics, then, is inextricably linked to his epistemology and politics. His urging everyone to exercize one's own *logos* in order to recognize the external *logos* of the cosmos entails a ethical and political scheme in which one is persuaded by the one best person, who can only be the one who exercises this capacity best. An intellectualist theory of ethics, to be sure, and, further, one that should remind us of that found later in Plato, especially in the *Republic,* where also is expressed the extreme view that it might be advisable to rid the city of adults and start from scratch with the young, who are to be guided by the best, i. e., most philosophical, citizen. It would be a gross methodological mistake to argue that because the

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unacceptable. Heraclitus is merely emphasizing the process through which one gets to know oneself.

[33] <ὡς> παῖς (many editors) is unnecessary.

[34] It has to be acknowledged that Marcus Aurelius cites this passage cites B 74 along with others in order to illustrate his immediate point, that being (τὰ ὄντα) displays not a simple progression but an amazing range of relationships. His source of Heraclitean fragments, however, is almost certainly simply a list of excerpts bereft of context. See further my article "The Fate of Heraclitus' book in later antiquity," in E. Hülsz (ed.), *Nuevos ensayos sobre Heráclito: Actas del Symposium Heracliteum Secundum* (Mexico City 2010) 443–458.

few disjointed fragments of Heraclitus' ethical theories are consisent with the far more extensive and complex theories of Plato, the latter (or Socrates) must have derived his ethics from the former—but the similarities between the two are striking, and one may conclude this investigation wondering whether there was more in the lost parts of Heraclitus' ethics that would strike us as Platonic.[35]

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[35] The rather large literature on Plato's use and reminiscence of Heraclitus, none of which will be cited here, concentrates almost entirely on epistemological and cosmological matters.

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General Index

Abaris 44–45, 48
Academics 33
Aeneas of Gaza 155
Aenesidemus 151, 235 n.22, 237 n.30, 246–247
Akousmata, akousmatikoi 38, 49, 168, 195
Alcmaeon 35, 38–39, 41
Allegory 50, 153 n.14, 194, 196 *see also* Style
Ambiguity *see* Style
Ameinias, teacher of Parmenides 44, 47, 118
Amyclas 44
Anaxagoras 14, 15 n.26, 28, 36, 121, 173, 177–179, 182, 232–233, 250–251,
Anaximander 6–11, 17, 21–21, 29, 34, 167, 174–184, 187–188, 193, 197, 204
Anaximander the Younger 37, 49–50, 141–142, 163–164
Anaximenes 163, 169, 174, 179–187, 197, 233, 236, 250, 254–257
Anthropomorphism 173, 175–176, 187–188, 197
ἄπειρον 6–8, 164 n.2, 173–180, 183–184
ἀπο κοινοῦ 283 n.6, 297
Apollo 44–45, 122, 172, 185, 191, 195 n.57, 227, 290, 324
Ares 194
Arius Didymus 241, 247, 259 n.75, 306 n.10, 314 n.26
ἀρχή 27, 102–103, 133, 136, 255
Archytas 4, 23–25, 35, 37, 39, 42–43, 54–56, 59, 76, 140
Arcturus 192
Aristeas 44–45, 48
Aristophanes 167 n.7, 171
Aristotle 3 n.1, 7 n.9, 18–21, 27–29, 33–34, 36–40, 50, ch. 3 *passim*, 129, 136, 139, 149, 152, 163, 165, 173, 185, 235, 239–242, 265, 282, 284, 303
Aristoxenus 34, 37, 39, 41–46, 48, 56, 74, 76
Artemis 191
Atomists 11, 16

Barnes, J. 4–7, 13, 16, 21, 174
Beauty 26–27, 29, 208–209
Birth 153, 155, 159, 168–170, 175, 184, 228–231, 242, 251–252, 306
Böckh, A. 35
Body 153–160, 173, 231 n.13, 232–234, 237, 244, 247, 251, 259
Bolton, J. 45
Bolton, R. 322
Bow 124–125, 143, 186, 196, 263–266
Breath 129, 151–153, 180, 233, 237 n.28, 246–247, 254, 259–260
Brontinus 47–48
Burkert, W. 3 n.1, 34–35, 38, 43, 72 n.41, 99, 147
Burnet, J. 163 n.2, 286–287

Cebes of Thebes 44, 76
Cerberus 167
Cercops 39–40
Chaos 183–184
Charondas 44
Chiasmus 177–178
Children, boys 129, 153, 155, 210, 218, 238, 266–273, 277–280, 333
Cleanthes 241, 246–247, 289 n.24, 306, 324

Clement of Alexandria 38
Cleinias 44
Continua 126, 128–135, 137, 139, 141–143
Cornford, F. M. 3,
Cosmos 9, 13–14, 17–18, 60, 67–70, 72–74, 97 n.104, 99, 104, 108–109, 114–115, 118, 121–122, 127–128, 130–133, 135–143, 165–166, 168–169, 172–176, 179–184, 186–188, 197, 207, 220, 222, 226 n.4, 256–257, 273–274, 287 n.19, 306, 318–319
Cratylus 304–305, 308, 311–312, 314
Cube, duplication of 24 n.52, 25
Cylon 46

Daimôn 17 n.36, 147, 150–151, 155–158
Damon 36, 40
Death 114, 149, 153–158, 160, 168–170, 190, 196, 228, 231, 238, 242, 244, 251–254, 293 n.41
Demiurgy 165–166
Democedes 35, 44, 46–47
Democritus 6 n.6, 15, 16 n.33, 28–29, 33, 42, 74, 217, n.24, 239
Derveni Papyrus 17 nn.35–36, 130–131, 159 n.24, 161 n.30, 166
Diatonic scale 128
Dichaearchus 34
Diocles 43
Diodorus of Aspendus 42
Diodotus grammaticus 323–324
Diogenes of Apollonia 152 n.11, 178 n.26, 232–233, 239, 241, 246, 250, 255
Diogenes Laertius 160, 172, 173 n.14, 175 n.20, 178–181, 191, 240–241, 293 n.40, 323–324
Dionysus 153 n.14, 190, 194
Divinity 12, 158–159, ch. 6 *passim*, 212–213, 219–220, 234
Division 73 n.43, 118, 283, 314
Dyad 7, 137
Echecrates 43, 75–76
Ecphantus 44
Empedocles 15, 28, 36, 45, 48, 121, 133, 147, 150–151, 159, 180–182, 207, 216, 239, 243, 254, 337
Epicharmus 40
Eschatology 147, 160–161, 169, 252
Epigenes 39–40, 48
Ethics 28, 202, 204, 207, 217, 219, 243–244, 248, 282, 289, 293–299, ch. 12 *passim*
Eudaimonism 248
Eudemus 34
Eurytus 39, 43, 56 n.13, 59, 75–76, 112, 119
Exhalation 149–153, 156–158, 239–243, 246, 306
Existence 105 n.33, 318, 321 n.1

Fire 8, 33, 63, 72, 73 n.43, 76, 89, 114–115, 125–126, 129–135, 148–149, 152, 158, 182 n.35, 186–188, 192–194, 213, 227, 231 n.13, 235–239, 241–242, 245–246, 253–254
Flux 121, 147 n.2, 205, 263 n.2, 282, 326, ch. 11 *passim*
Form and matter 135

Gadamer, H.-G. 284 n.8
Graham, D. 125–126

Harmony 3 n.1, 6, 10–14, 16–17, 21, 25, 69–70, 84, 96 n.101, 122–126, 128, 130, 134–135, 137–143, 203, ch. 9 *passim*,
Hecataeus of Miletus 167, 169, 203, 288
Heidegger, M. 284 n.8
Hermodorus of Ephesus 332
Hesiod 159, 163 n.2, 165–171, 175–176, 179 n.28, 181–184, 190, 192, 194, 196–97, 202, 212, 217, 220, 288
Hicetas 44
Hippias 312
Hippodamus 40

Hippasus 27 n.59, 26, 39, 42, 46–47, 152
Hippocrates of Chios 40, 42, 47
Hippon 36, 38–39, 41, 47, 239
Hippys of Rhegium 40
Huffman, C. 35, 53, 54–56, 72–75, 77–78, 98–99, 107–109
Hume, D. 316
Hybris 297, 331–332

Iamblichus 38, 43–44, 46, 49, 155, 158, 195 n.57, 259
Iccus 36, 46
Identity 115–116, 220, 250, 265, 294, 311, 314, 316–317
Infinite, infinity *see* ἄπειρον
Intermediaries, intermediates 18–19
Ion of Chius 40, 48

Jesus 171
Justice 17 n.36, 29, 61, 76, 79–82, 85, 87, 90–92, 95, 97, 106, 111, 114–116, 130–131, 141–142, 176–177, 188, 193–194, 197, 204, 206–208, 211–213, 218–219, 330

Kahn, C. 8 n.13, 123–125, 179 n.28, 201 n.1, 203, 205, 210, 235, 241 n.39, 244 n.33, 245, 283 n.6, 288–290, 313–314, 317
Kirk, G. 140, 142, 201 n.1, 214 n.19, 231 n.13, 239 n.35, 240, 241 n.39, 284 n.8, 288, 303, 313, 315
Kykeon 132

Law 115, 184, 186–188, 202, 206–207, 213, 220, 273, 285, 288, 289 n.24, 292, 319, 323 n.3, 330–331
Law, divine 201 n.1, 207, 211–213, 289, 323 n.3
Leibniz 22, 29
Leucippus 16 n.33, 217
Life *see* Death
Limited *see* Unlimited
Linguistic density 283 n.6, 317 *see also* Style
Lucian 74
Lycon 41–42
Lyre 69, 124–125, 138

Macrobius 148, 150, 241
Marcovich, M. 188 n.44, 231 n.13, 328, 252 n.60, 281 n.3, 285 n.11, 288, 294 n.43, 296, 303–304, 311–313, 315, 316 n.13, 330, 332 nn.29, 32
Mathemata, mathematikoi 38, 42, 47
Measure, *metron* 201, ch. 7 *passim*, 253, 287, 289, 296–298, 315
Μέθεξις 20 n.43
Meinwald, C. 137–138
Melissus 45, 67 n.28, 173
Milon 36, 44–46
Menestor 36, 38, 47
Metempsychosis 36, 49, 161, 168
Monism 133, 180 n.31, 185–187
Music (of the spheres) 4, 8–9, 11, 61, 79, 84, 87, 123, 140

Narrative 283–285
Nature 10–11, 17, 57, 60, 67–68, 71, 77, 79–84, 87–88, 105, 114, 122–123, 127–128, 133, 139, 143, 150–151, ch. 6 *passim*, 201 n.1, 202, 204, 209, 215–216, 219–221, 225–227, 282–285, 288, 290–293, 296–298, 318–319, 323–324, 329
Neopythagoreanism 3
Number ch. 1 *passim,* 33, 37–38, ch. 3 *passim*, 126–128, 136–140
Number atomism 3
Number ratio 124, 126–127, 140, 143, 209

Ocellus 40
Oenopides 40, 42, 47
Olbia, bone plates 160–161
Onatas 46
One, The 7–8, 57, 63–67, 69, 71–73, 77, 79, 81, 88–89, 91, 100, 104–109, 115, 118
Opposites 13, 115, 121, 125–126, 128–130, 134–135, 140–143, 177, 183, 186–187, 190, 202,

253, 263–265, 273, 282, 292, 315–316, 319, 330 *see also* Unity of opposites
Orpheus, Orphics 40, 159–160, 168 n.10, 166, 168–169, 189, 196, 258–259

Παλίντροπος, παλίντονος 125
Parmenides 3 n.1, 15, 22, 26, 30, 45, 67, 180, 216–217, 222, 275, 278, 319
Paron 39–40
Petron 39–40
Phaethon 58, 193
Phanton 43
Pherecydes of Syrus 165–167, 169, 174 n.16, 183
Philo of Alexandria 237
Philolaos 3–4, 6–7, 13, 15 n.31, 20 n.44, 22–25, 35–39, 43–44, 47, 53–54, 56–57, 59, 66–67, 69–77, 98–99, 101–112, 118–119, ch.4 *passim*
Philoponus 255
Philosophy, nature of 281–282
Phintias 36
Pindar 151 n.8, 216, 218, 252, 325 n.10, 326, 328
Φύσις *see* Nature
Plato 19–20, 23, 24 n.52, 25–26, 39, 46–47, 55, 63, 94, 102, 107, 118, 136–138, 155, 157, 165, 168 n.9, 196 n.58, 201, 205–214, 218, 222, 232, 248, 280, 282, 284, 303, 305, 308–309, 312, 318, 322, 328 n.19, 333–334
Platonism 20 n.43, 21, 25
Plotinus 155 n.16
Plutarch 22, 24–25, 150–151, 157–158, 309–312, 332 n.32
Polyclitus 40
Polymnastes 43
Polytheism 169, 176, 191
Pythagoreans chs. 1–3 *passim*, 123–124, 136, 167, 168 nn.9–10, 195–196

Races of men 157, 159, 190–191
Ratio 9–10, 12–16, 21, 62, 80–81, 116–117, 124, 126–127, 137–140, 202–203, 208–209, 213–214, 296
Riddles 252 n.60, 266–267, 269–72
Rivers 287, ch. 11 *passim*, 326, 329

Separation 21, 26, 136, 245
Simmias 44, 76
Simonides 325–327
Sleep 123, 151, 153, 155, 190–191, 238, 245–246, 276, 284–285, 289 n.26, 291, 306–307
Solon 218–220
Sophocles 188–189, 251
Soul 58, 61, 79–81, 85, 90–92, 95, 97, 114–116, 123, ch. 5 *passim*, 168–169, 80, 189–190, 206, 208–211, 215–216, ch. 8 *passim*, 274–275, 292–298, 306, 329
Speusippus 18 n.39, 34, 94 n.98
Spintharus 44
Symbola 34, 49–50
Stoics, Stoicism 149, 152 n.12, 203 n.3, 204, 229 n.9, 236, 245–247, 258–260, 276, 289 nn.24, 27, 306 n.10, 324
Style, prose 115, 161, 167 n.7, 176–182, 185, 190–191, 195, 222, 227, 230, 266–267, 285 n.11, 293, 313–314, 317
Σῶμα-σῆμα 155–156, 160, 207 n.12, 247 *see also* Body
Σωφροσύνη 294, n.42, 329, 332 *see also* Measure

Tetraktys 3 n.1, 29
Taboos 48–50
Tarán, L. 304–312
Theagenes of Rhegium 196
Theodoret 157, 328
Theodorus of Cyrene 36, 39, 42, 47
Theogony, rhapsodic 168 n.10
Timaeus of Locri 40
Τροπαί 125

Unity of opposites 126, 128, 130, 134, 140, 142, 186–187, 205 n.10, 263–265, 273, 282, 292
Unlimited 6–7, 13, 59, 63–74, 79, 86–90, 99–101, 103–109, 111, 118, 127–143,

Vegetarianism 37, 48
Water (not rivers, q.v.) 17, 79, 81 n.64, 113–114, 132, 134, 141, 149–150, 158, 172, 174–175, 181, 186, 214, 228–232, 234–244, 254, 258, 293 n.41
World order *see Cosmos*

Xenophon 232
Xenophanes 14–16, 33, 74, 161, 169–179, 184, 187–189, 191–192, 195–197, 219–220, 237, 288, 290 n.30, 296 n.56
Xenophilus 43, 74, 76
Xuphus 39–40

Zas 165
Zaleucus 44
Zeller, E. 33

Index Locorum Potiorum

Aeschylus
Ag. 1465–6 251

Alexander Aphrod.
In Meta. 38.10 29, 81

Anaxagoras
B 12 177, 182

Anaximander
A 1.1 175
10 174
11 176
15 175
B 1 141, 176, 178
2 180

Anaximenes
A 7 181
B 2 233, 254

Archytas
A 7a 24
B 1 23

Aristophanes
Nu. 247–8 167 n.7
367 167 n.7
373 171
374

Aristotle
An. 404a16 58
405a21 239, 255
410b27 259
411a7 152
Cael. 268a11 77
279a32 165
300a14 57, 60, 77
GC 336b28 318
Meta. 983b6 27
985b23–86a21 78
985b25 62
985b27 61
985b31 61
986a1 62
986a2 72
986a15 58, 63
986a17 64
986a21 61, 64
986b2 118
986b9 98 n.107
987a9 118
987a13 63, 88
987a20 118
987a22 63
987b11 61
987b22 63
986b26 173
987b27 19 n.41
987b29 118
990a21 60
1010a12 305
1083b8 91
1080b17 60
1080b30 57, 77
1083b11 60, 118
1083b18 60, 61
1090a20 18, 61, 93
1090a22 61
1090a24 61
1090a32 61
1091a12 118
1091a15 63
1092b8 27 n.61
1092b10 59
Mete. 324b29 58
345 a13 58
Phys. 203b6–15 7–8

Pol. 1267a34 316
Fr. 7 40

Aristoxenus
Fr. 77 Müller 11 n.17

Calcidius
In Pl.Tim. ch.25 246 n.46

Cicero
Nat.Deor. 1.107 40
  3.35 235 n.22

Clement Alex.
Strom. 1.21.131 39 n.24
  3.3.21.1 153
  4.14.4 157
  5.14.105.2 153
  6.2.17 258

P.Derveni
  4.7–8 158 n.24

Carmina Epigraphica Graeca
396 Hansen 327

Diogenes of Apollonia
B 4 232

Empedocles
B 17.28 150 n.8
  21.9 182
  110.5 150 n.8
  112.4 159
  115.8 159 n.26
  126 151

Euripides
Ba. 395 327 n.16

Galen
4.786 K 148, 241 n.41, 244

Hecataeus
F 27 *FGrHist* 167

Heraclitus
A 1.1 328 n.19
  1.6 160
  1.7–11 148
  1.5 323
  1.12 323
  1.15 323
  5 239
  6 304, 305
  11 240 n.38
  15 148, 149, 150, 241
  21 328
B 1 114, 123, 214, 283 nn.1,6, 285–286, 307, 332 n.30
  2 285, 307, 332
  3 17 n.36, 123, 131, 158
  4 328–329
  5 189
  11 155
  12 241, 247, 287, ch. 11 *passim*, 326
  14 160
  15 153 n.14, 160
  16 193, 298
  17 278, 307
  18 270, 294
  22 294
  24 156, 157
  25 156
  26 247 n.50, 254
  28 193, 213, 277, 327
  29 325, 326
  30 114, 130, 185–186, 207, 213, 253, 287, 289
  31 17, 114, 125, 148 n.3, 235, 242, 289
  32 192, 196, 221, 291
  33 115, 326
  36 114, 149–150, 227–228, 229 n.9, 242–243, 252–253, 258, 293–294
  39 290
  40 220, 327 n.16
  41 188, 213, 219, 275, 291
  43 213, 297, 324, 331
  44 213, 324, 330

45 13, 215, 293
47 254, 331
48 196
49 326
49a 303, 305, 314
50 142, 185, 215, 291–292
51 124, 186, 263–264
52 333
53 114, 194
54 123, 141, 219, 265, 270
55 123
56 ch. 9 *passim*
60 253, 316
62 153–155, 222, 247, 252–253
63 190
64 114, 186, 192, 234
66 115, 193
67 12, 17, 115, 126, 177, 187, 194, 213, 221, 265 n.3
69 158
70 278
72 291
74 333
76 236
77 153, 155 n.15, 156, 190, 238
78 150, 298
79 333
80 115, 194, 289 n.25, 330
81 160, 203
84a 296
85 156, 213
87 290, 330
88 153–155
89 289 n.26
91 303, 305, 306, 308–311
93 185, 191, 227, 289
94 13, 131, 132, 158 n.24, 213, 297
96 159, 189
101 128, 273, 275, 294
101a 277 n.14
102 188, 330
103 295
107 123, 292
108 186, 289, 292
112 205, 209, 213, 297, 329
113 295, 332
114 187, 206–207, 213, 285, 289, 291, 322 n.3, 331–332
115 215, 295–296
116 295, 322 n.3, 332
117 153, 237, 297, 333
118 148, 153, 157, 298
119 150, 298
120 13, 192
121 331, 332, 333
123 122, 219, 288
129 278
135 328

Heraclitus Homericus
24 305

Herodotus
1.37.3 172
2.17.1 216

Hesiod
Op. 3–8 195
121-3 159
Fr. 278 M-W 217 n.26
303 197 n.60

Hippolytus
Ref. 1.6 6, 8 nn.10–11

Isocrates
Bus. 38 169

Leucippus
B 2 217

Maximus of Tyre
41.4 253–254

Orpheus
T 463 Bernabé 159

Parmenides
B 1.30 327
  7.5 217
  8.34–6 22

Pherecydes
B 1 165
  2 166

Philo
Aet.Mund. 21 237 n.30

Philolaus
A 29 14–15
B 1 67
  2 67, 127, 132
  3 67
  4 22, 68
  5 68, 126
  6 68, 128, 130, 133–137, 139
  6a 127, 129, 139
  7 68, 73, 129
  17 68–69

Pindar
P. 3.61–2 251
N. 3.40 328
I. 6.71–2 218
Fr. 131b S-M 157

Plato
Gorg. 507e-508a 206
  525a 208
Lg. 715e-16b 211
  716c-d2 212
Phdo. 86c 210 n.15
  108c 210 n.15
Phdr. 249c 24
  270c 226–227
Resp. 339b 210 n.15
  412a 210
  431b-c 210
  466b 210 n.15
  528a-d 25
Tht. 160d 304
Tim. 31c-32b 25

Plutarch
E ap. Delph. 392b 305
Is. 362a-b 153 n.14
Qu.Nat. 912a 305
Qu.Conv. 718e 24
v.Rom. 28.8 157

Porphyry
In Ptol.Harm. 1.3 23

Proclus
In Resp. 2.20.23 155

Sextus Empiricus
AM 7.126 15 n.29
  7.127–30 151, 245
Pyrrh. 3.230 159

Simonides
531 *PMG* 325

Solon
  1 West 218
  16 218, 219
17 218

Sophocles
Ant. 559–60 251
  1089 327 n.17

Stobaeus
  1.49.32.104 259

Theodoret
Gr.Aff.Cur. 5.18 237 n.29
  11.7 328 n.18

Theognis
  1171–2 219

Thucydides
  1.114.1 92

Vettius Valens
  317.19 Pingree 259

Xenocrates
Fr. 9 Heinze 10 n.16, 11 n.17

Xenophanes
A 1.19 173
  12 170
B 1 195
  5 188
  11 169
  23 169, 173, 219
  24 173, 178
  25 170, 219
  26 171
  32 171
  34 184, 219
  35 219

Xenophon
Mem. 1.4.8 232

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General Index

Abaris 44–45, 48
Academics 33
Aeneas of Gaza 155
Aenesidemus 151, 235 n.22, 237 n.30, 246–247
Akousmata, akousmatikoi 38, 49, 168, 195
Alcmaeon 35, 38–39, 41
Allegory 50, 153 n.14, 194, 196 *see also* Style
Ambiguity *see* Style
Ameinias, teacher of Parmenides 44, 47, 118
Amyclas 44
Anaxagoras 14, 15 n.26, 28, 36, 121, 173, 177–179, 182, 232–233, 250–251,
Anaximander 6–11, 17, 21–21, 29, 34, 167, 174–184, 187–188, 193, 197, 204
Anaximander the Younger 37, 49–50, 141–142, 163–164
Anaximenes 163, 169, 174, 179–187, 197, 233, 236, 250, 254–257
Anthropomorphism 173, 175–176, 187–188, 197
ἄπειρον 6–8, 164 n.2, 173–180, 183–184
ἀπο κοινοῦ 283 n.6, 297
Apollo 44–45, 122, 172, 185, 191, 195 n.57, 227, 290, 324
Ares 194
Arius Didymus 241, 247, 259 n.75, 306 n.10, 314 n.26
ἀρχή 27, 102–103, 133, 136, 255
Archytas 4, 23–25, 35, 37, 39, 42–43, 54–56, 59, 76, 140
Arcturus 192
Aristeas 44–45, 48
Aristophanes 167 n.7, 171
Aristotle 3 n.1, 7 n.9, 18–21, 27–29, 33–34, 36–40, 50, ch. 3 *passim*, 129, 136, 139, 149, 152, 163, 165, 173, 185, 235, 239–242, 265, 282, 284, 303
Aristoxenus 34, 37, 39, 41–46, 48, 56, 74, 76
Artemis 191
Atomists 11, 16

Barnes, J. 4–7, 13, 16, 21, 174
Beauty 26–27, 29, 208–209
Birth 153, 155, 159, 168–170, 175, 184, 228–231, 242, 251–252, 306
Böckh, A. 35
Body 153–160, 173, 231 n.13, 232–234, 237, 244, 247, 251, 259
Bolton, J. 45
Bolton, R. 322
Bow 124–125, 143, 186, 196, 263–266
Breath 129, 151–153, 180, 233, 237 n.28, 246–247, 254, 259–260
Brontinus 47–48
Burkert, W. 3 n.1, 34–35, 38, 43, 72 n.41, 99, 147
Burnet, J. 163 n.2, 286–287

Cebes of Thebes 44, 76
Cerberus 167
Cercops 39–40
Chaos 183–184
Charondas 44
Chiasmus 177–178
Children, boys 129, 153, 155, 210, 218, 238, 266–273, 277–280, 333
Cleanthes 241, 246–247, 289 n.24, 306, 324

Clement of Alexandria 38
Cleinias 44
Continua 126, 128–135, 137, 139, 141–143
Cornford, F. M. 3,
Cosmos 9, 13–14, 17–18, 60, 67–70, 72–74, 97 n.104, 99, 104, 108–109, 114–115, 118, 121–122, 127–128, 130–133, 135–143, 165–166, 168–169, 172–176, 179–184, 186–188, 197, 207, 220, 222, 226 n.4, 256–257, 273–274, 287 n.19, 306, 318–319
Cratylus 304–305, 308, 311–312, 314
Cube, duplication of 24 n.52, 25
Cylon 46

Daimôn 17 n.36, 147, 150–151, 155–158
Damon 36, 40
Death 114, 149, 153–158, 160, 168–170, 190, 196, 228, 231, 238, 242, 244, 251–254, 293 n.41
Demiurgy 165–166
Democedes 35, 44, 46–47
Democritus 6 n.6, 15, 16 n.33, 28–29, 33, 42, 74, 217, n.24, 239
Derveni Papyrus 17 nn.35–36, 130–131, 159 n.24, 161 n.30, 166
Diatonic scale 128
Dichaearchus 34
Diocles 43
Diodorus of Aspendus 42
Diodotus grammaticus 323–324
Diogenes of Apollonia 152 n.11, 178 n.26, 232–233, 239, 241, 246, 250, 255
Diogenes Laertius 160, 172, 173 n.14, 175 n.20, 178–181, 191, 240–241, 293 n.40, 323–324
Dionysus 153 n.14, 190, 194
Divinity 12, 158–159, ch. 6 *passim*, 212–213, 219–220, 234
Division 73 n.43, 118, 283, 314
Dyad 7, 137

Echecrates 43, 75–76
Ecphantus 44
Empedocles 15, 28, 36, 45, 48, 121, 133, 147, 150–151, 159, 180–182, 207, 216, 239, 243, 254, 337
Epicharmus 40
Eschatology 147, 160–161, 169, 252
Epigenes 39–40, 48
Ethics 28, 202, 204, 207, 217, 219, 243–244, 248, 282, 289, 293–299, ch. 12 *passim*
Eudaimonism 248
Eudemus 34
Eurytus 39, 43, 56 n.13, 59, 75–76, 112, 119
Exhalation 149–153, 156–158, 239–243, 246, 306
Existence 105 n.33, 318, 321 n.1

Fire 8, 33, 63, 72, 73 n.43, 76, 89, 114–115, 125–126, 129–135, 148–149, 152, 158, 182 n.35, 186–188, 192–194, 213, 227, 231 n.13, 235–239, 241–242, 245–246, 253–254
Flux 121, 147 n.2, 205, 263 n.2, 282, 326, ch. 11 *passim*
Form and matter 135

Gadamer, H.-G. 284 n.8
Graham, D. 125–126

Harmony 3 n.1, 6, 10–14, 16–17, 21, 25, 69–70, 84, 96 n.101, 122–126, 128, 130, 134–135, 137–143, 203, ch. 9 *passim*,
Hecataeus of Miletus 167, 169, 203, 288
Heidegger, M. 284 n.8
Hermodorus of Ephesus 332
Hesiod 159, 163 n.2, 165–171, 175–176, 179 n.28, 181–184, 190, 192, 194, 196–97, 202, 212, 217, 220, 288
Hicetas 44
Hippias 312
Hippodamus 40

Hippasus 27 n.59, 26, 39, 42, 46–47, 152
Hippocrates of Chios 40, 42, 47
Hippon 36, 38–39, 41, 47, 239
Hippys of Rhegium 40
Huffman, C. 35, 53, 54–56, 72–75, 77–78, 98–99, 107–109
Hume, D. 316
Hybris 297, 331–332

Iamblichus 38, 43–44, 46, 49, 155, 158, 195 n.57, 259
Iccus 36, 46
Identity 115–116, 220, 250, 265, 294, 311, 314, 316–317
Infinite, infinity *see* ἄπειρον
Intermediaries, intermediates 18–19
Ion of Chius 40, 48

Jesus 171
Justice 17 n.36, 29, 61, 76, 79–82, 85, 87, 90–92, 95, 97, 106, 111, 114–116, 130–131, 141–142, 176–177, 188, 193–194, 197, 204, 206–208, 211–213, 218–219, 330

Kahn, C. 8 n.13, 123–125, 179 n.28, 201 n.1, 203, 205, 210, 235, 241 n.39, 244 n.33, 245, 283 n.6, 288–290, 313–314, 317
Kirk, G. 140, 142, 201 n.1, 214 n.19, 231 n.13, 239 n.35, 240, 241 n.39, 284 n.8, 288, 303, 313, 315
Kykeon 132

Law 115, 184, 186–188, 202, 206–207, 213, 220, 273, 285, 288, 289 n.24, 292, 319, 323 n.3, 330–331
Law, divine 201 n.1, 207, 211–213, 289, 323 n.3
Leibniz 22, 29
Leucippus 16 n.33, 217
Life *see* Death
Limited *see* Unlimited
Linguistic density 283 n.6, 317 *see also* Style
Lucian 74
Lycon 41–42
Lyre 69, 124–125, 138

Macrobius 148, 150, 241
Marcovich, M. 188 n.44, 231 n.13, 328, 252 n.60, 281 n.3, 285 n.11, 288, 294 n.43, 296, 303–304, 311–313, 315, 316 n.13, 330, 332 nn.29, 32
Mathemata, mathematikoi 38, 42, 47
Measure, *metron* 201, ch. 7 *passim*, 253, 287, 289, 296–298, 315
Μέθεξις 20 n.43
Meinwald, C. 137–138
Melissus 45, 67 n.28, 173
Milon 36, 44–46
Menestor 36, 38, 47
Metempsychosis 36, 49, 161, 168
Monism 133, 180 n.31, 185–187
Music (of the spheres) 4, 8–9, 11, 61, 79, 84, 87, 123, 140

Narrative 283–285
Nature 10–11, 17, 57, 60, 67–68, 71, 77, 79–84, 87–88, 105, 114, 122–123, 127–128, 133, 139, 143, 150–151, ch. 6 *passim*, 201 n.1, 202, 204, 209, 215–216, 219–221, 225–227, 282–285, 288, 290–293, 296–298, 318–319, 323–324, 329
Neopythagoreanism 3
Number ch. 1 *passim,* 33, 37–38, ch. 3 *passim*, 126–128, 136–140
Number atomism 3
Number ratio 124, 126–127, 140, 143, 209

Ocellus 40
Oenopides 40, 42, 47
Olbia, bone plates 160–161
Onatas 46
One, The 7–8, 57, 63–67, 69, 71–73, 77, 79, 81, 88–89, 91, 100, 104–109, 115, 118
Opposites 13, 115, 121, 125–126, 128–130, 134–135, 140–143, 177, 183, 186–187, 190, 202,

253, 263–265, 273, 282, 292, 315–316, 319, 330 *see also* Unity of opposites
Orpheus, Orphics 40, 159–160, 168 n.10, 166, 168–169, 189, 196, 258–259

Παλίντροπος, παλίντονος 125
Parmenides 3 n.1, 15, 22, 26, 30, 45, 67, 180, 216–217, 222, 275, 278, 319
Paron 39–40
Petron 39–40
Phaethon 58, 193
Phanton 43
Pherecydes of Syrus 165–167, 169, 174 n.16, 183
Philo of Alexandria 237
Philolaos 3–4, 6–7, 13, 15 n.31, 20 n.44, 22–25, 35–39, 43–44, 47, 53–54, 56–57, 59, 66–67, 69–77, 98–99, 101–112, 118–119, ch.4 *passim*
Philoponus 255
Philosophy, nature of 281–282
Phintias 36
Pindar 151 n.8, 216, 218, 252, 325 n.10, 326, 328
Φύσις *see* Nature
Plato 19–20, 23, 24 n.52, 25–26, 39, 46–47, 55, 63, 94, 102, 107, 118, 136–138, 155, 157, 165, 168 n.9, 196 n.58, 201, 205–214, 218, 222, 232, 248, 280, 282, 284, 303, 305, 308–309, 312, 318, 322, 328 n.19, 333–334
Platonism 20 n.43, 21, 25
Plotinus 155 n.16
Plutarch 22, 24–25, 150–151, 157–158, 309–312, 332 n.32
Polyclitus 40
Polymnastes 43
Polytheism 169, 176, 191
Pythagoreans chs. 1–3 *passim*, 123–124, 136, 167, 168 nn.9–10, 195–196

Races of men 157, 159, 190–191
Ratio 9–10, 12–16, 21, 62, 80–81, 116–117, 124, 126–127, 137–140, 202–203, 208–209, 213–214, 296
Riddles 252 n.60, 266–267, 269–72
Rivers 287, ch. 11 *passim*, 326, 329

Separation 21, 26, 136, 245
Simmias 44, 76
Simonides 325–327
Sleep 123, 151, 153, 155, 190–191, 238, 245–246, 276, 284–285, 289 n.26, 291, 306–307
Solon 218–220
Sophocles 188–189, 251
Soul 58, 61, 79–81, 85, 90–92, 95, 97, 114–116, 123, ch. 5 *passim*, 168–169, 80, 189–190, 206, 208–211, 215–216, ch. 8 *passim*, 274–275, 292–298, 306, 329
Speusippus 18 n.39, 34, 94 n.98
Spintharus 44
Symbola 34, 49–50
Stoics, Stoicism 149, 152 n.12, 203 n.3, 204, 229 n.9, 236, 245–247, 258–260, 276, 289 nn.24, 27, 306 n.10, 324
Style, prose 115, 161, 167 n.7, 176–182, 185, 190–191, 195, 222, 227, 230, 266–267, 285 n.11, 293, 313–314, 317
Σῶμα-σῆμα 155–156, 160, 207 n.12, 247 *see also* Body
Σωφροσύνη 294, n.42, 329, 332 *see also* Measure

Tetraktys 3 n.1, 29
Taboos 48–50
Tarán, L. 304–312
Theagenes of Rhegium 196
Theodoret 157, 328
Theodorus of Cyrene 36, 39, 42, 47
Theogony, rhapsodic 168 n.10
Timaeus of Locri 40
Τροπαί 125

Unity of opposites 126, 128, 130, 134, 140, 142, 186–187, 205 n.10, 263–265, 273, 282, 292
Unlimited 6–7, 13, 59, 63–74, 79, 86–90, 99–101, 103–109, 111, 118, 127–143,

Vegetarianism 37, 48
Water (not rivers, q.v.) 17, 79, 81 n.64, 113–114, 132, 134, 141, 149–150, 158, 172, 174–175, 181, 186, 214, 228–232, 234–244, 254, 258, 293 n.41
World order *see Cosmos*

Xenophon 232
Xenophanes 14–16, 33, 74, 161, 169–179, 184, 187–189, 191–192, 195–197, 219–220, 237, 288, 290 n.30, 296 n.56
Xenophilus 43, 74, 76
Xuphus 39–40

Zas 165
Zaleucus 44
Zeller, E. 33

Index Locorum Potiorum

Aeschylus
Ag. 1465–6 251

Alexander Aphrod.
In Meta. 38.10 29, 81

Anaxagoras
B 12 177, 182

Anaximander
A 1.1 175
10 174
11 176
15 175
B 1 141, 176, 178
2 180

Anaximenes
A 7 181
B 2 233, 254

Archytas
A 7a 24
B 1 23

Aristophanes
Nu. 247–8 167 n.7
367 167 n.7
373 171
374

Aristotle
An. 404a16 58
405a21 239, 255
410b27 259
411a7 152
Cael. 268a11 77
279a32 165
300a14 57, 60, 77
GC 336b28 318
Meta. 983b6 27
985b23–86a21 78
985b25 62
985b27 61
985b31 61
986a1 62
986a2 72
986a15 58, 63
986a17 64
986a21 61, 64
986b2 118
986b9 98 n.107
987a9 118
987a13 63, 88
987a20 118
987a22 63
987b11 61
987b22 63
986b26 173
987b27 19 n.41
987b29 118
990a21 60
1010a12 305
1083b8 91
1080b17 60
1080b30 57, 77
1083b11 60, 118
1083b18 60, 61
1090a20 18, 61, 93
1090a22 61
1090a24 61
1090a32 61
1091a12 118
1091a15 63
1092b8 27 n.61
1092b10 59
Mete. 324b29 58
345 a13 58
Phys. 203b6–15 7–8

Pol. 1267a34 316
Fr. 7 40

Aristoxenus
Fr. 77 Müller 11 n.17

Calcidius
In Pl.Tim. ch.25 246 n.46

Cicero
Nat.Deor. 1.107 40
  3.35 235 n.22

Clement Alex.
Strom. 1.21.131 39 n.24
  3.3.21.1 153
  4.14.4 157
  5.14.105.2 153
  6.2.17 258

P.Derveni
  4.7–8 158 n.24

Carmina Epigraphica Graeca
396 Hansen 327

Diogenes of Apollonia
B 4 232

Empedocles
B 17.28 150 n.8
  21.9 182
  110.5 150 n.8
  112.4 159
  115.8 159 n.26
  126 151

Euripides
Ba. 395 327 n.16

Galen
4.786 K 148, 241 n.41, 244

Hecataeus
F 27 *FGrHist* 167

Heraclitus
A 1.1 328 n.19
  1.6 160
  1.7–11 148
  1.5 323
  1.12 323
  1.15 323
  5 239
  6 304, 305
  11 240 n.38
  15 148, 149, 150, 241
  21 328
B 1 114, 123, 214, 283 nn.1,6, 285–286, 307, 332 n.30
  2 285, 307, 332
  3 17 n.36, 123, 131, 158
  4 328–329
  5 189
  11 155
  12 241, 247, 287, ch. 11 *passim*, 326
  14 160
  15 153 n.14, 160
  16 193, 298
  17 278, 307
  18 270, 294
  22 294
  24 156, 157
  25 156
  26 247 n.50, 254
  28 193, 213, 277, 327
  29 325, 326
  30 114, 130, 185–186, 207, 213, 253, 287, 289
  31 17, 114, 125, 148 n.3, 235, 242, 289
  32 192, 196, 221, 291
  33 115, 326
  36 114, 149–150, 227–228, 229 n.9, 242–243, 252–253, 258, 293–294
  39 290
  40 220, 327 n.16
  41 188, 213, 219, 275, 291
  43 213, 297, 324, 331
  44 213, 324, 330

45 13, 215, 293
47 254, 331
48 196
49 326
49a 303, 305, 314
50 142, 185, 215, 291–292
51 124, 186, 263–264
52 333
53 114, 194
54 123, 141, 219, 265, 270
55 123
56 ch. 9 *passim*
60 253, 316
62 153–155, 222, 247, 252–253
63 190
64 114, 186, 192, 234
66 115, 193
67 12, 17, 115, 126, 177, 187, 194, 213, 221, 265 n.3
69 158
70 278
72 291
74 333
76 236
77 153, 155 n.15, 156, 190, 238
78 150, 298
79 333
80 115, 194, 289 n.25, 330
81 160, 203
84a 296
85 156, 213
87 290, 330
88 153–155
89 289 n.26
91 303, 305, 306, 308–311
93 185, 191, 227, 289
94 13, 131, 132, 158 n.24, 213, 297
96 159, 189
101 128, 273, 275, 294
101a 277 n.14
102 188, 330
103 295
107 123, 292
108 186, 289, 292
112 205, 209, 213, 297, 329
113 295, 332
114 187, 206–207, 213, 285, 289, 291, 322 n.3, 331–332
115 215, 295–296
116 295, 322 n.3, 332
117 153, 237, 297, 333
118 148, 153, 157, 298
119 150, 298
120 13, 192
121 331, 332, 333
123 122, 219, 288
129 278
135 328

Heraclitus Homericus
24 305

Herodotus
1.37.3 172
2.17.1 216

Hesiod
Op. 3–8 195
121-3 159
Fr. 278 M-W 217 n.26
303 197 n.60

Hippolytus
Ref. 1.6 6, 8 nn.10–11

Isocrates
Bus. 38 169

Leucippus
B 2 217

Maximus of Tyre
41.4 253–254

Orpheus
T 463 Bernabé 159

Parmenides
B 1.30 327
  7.5 217
  8.34–6 22

Pherecydes
B 1 165
  2 166

Philo
Aet.Mund. 21 237 n.30

Philolaus
A 29 14–15
B 1 67
  2 67, 127, 132
  3 67
  4 22, 68
  5 68, 126
  6 68, 128, 130, 133–137, 139
  6a 127, 129, 139
  7 68, 73, 129
  17 68–69

Pindar
P. 3.61–2 251
N. 3.40 328
I. 6.71–2 218
Fr. 131b S-M 157

Plato
Gorg. 507e-508a 206
  525a 208
Lg. 715e-16b 211
  716c-d2 212
Phdo. 86c 210 n.15
  108c 210 n.15
Phdr. 249c 24
  270c 226–227
Resp. 339b 210 n.15
  412a 210
  431b-c 210
  466b 210 n.15
  528a-d 25
Tht. 160d 304
Tim. 31c-32b 25

Plutarch
E ap. Delph. 392b 305
Is. 362a-b 153 n.14
Qu.Nat. 912a 305
Qu.Conv. 718e 24
v.Rom. 28.8 157

Porphyry
In Ptol.Harm. 1.3 23

Proclus
In Resp. 2.20.23 155

Sextus Empiricus
AM 7.126 15 n.29
  7.127–30 151, 245
Pyrrh. 3.230 159

Simonides
531 *PMG* 325

Solon
  1 West 218
  16 218, 219
17 218

Sophocles
Ant. 559–60 251
  1089 327 n.17

Stobaeus
  1.49.32.104 259

Theodoret
Gr.Aff.Cur. 5.18 237 n.29
  11.7 328 n.18

Theognis
  1171–2 219

Thucydides
  1.114.1 92

Vettius Valens
  317.19 Pingree 259

Xenocrates
Fr. 9 Heinze 10 n.16, 11 n.17

Xenophanes
A 1.19 173
  12 170
B 1 195
  5 188
  11 169
  23 169, 173, 219
  24 173, 178
  25 170, 219
  26 171
  32 171
  34 184, 219
  35 219

Xenophon
Mem. 1.4.8 232